November/December 2009 >> Vol.45

AECMAGAZINE

DESIGN, MANAGEMENT & COLLABORATION IN THE BUILT ENVIRONMENT



Inspiring innovation

Twenty-five years of Bentley Systems

Mastering conceptual design with Bonzai3D

Intel's Core i5 processor

BIM collaboration with ArchiCAD 13

AECMAGAZINE
DESIGN, MANAGEMENT & COLLABORATION IN THE BUILT ENVIRONMENT

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Bentley Systems gets straight to the point



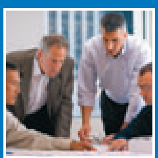
Bentley Systems has entered into a technology agreement with Pointools, a specialist in high-performance software to exploit point clouds captured by 3D laser scanning of infrastructure assets, including aerial LiDAR surveys. Through this agreement, Bentley has licensed Pointools' Vortex API engine for incorporation in MicroStation and all other software products that utilise Bentley's platform technology. More details on page 12.
www.bentley.com / www.pointools.co.uk

Kubit updates point cloud processor for AutoCAD



Kubit has announced the latest release of PointCloud and PointCloud Pro version 5.0. The software allows the display and processing of point clouds directly inside AutoCAD. Every point of a 3D cloud can be accessed and used in combination with all traditional AutoCAD commands. PointCloud also provides several tools for the analysis of 3D laser scan data, allowing for coordinate systems, polylines, planes and cylinders to be fitted to point cloud sections.
www.kubit-software.com

Excitech given Autodesk consulting partner status



Excitech has been given Autodesk Consulting Partner status under the Autodesk Channel Services Program in recognition of its expertise and experience in providing consulting services to its customers. This latest move builds upon the recent announcement of Excitech Consulting as a dedicated division using the experience developed and delivered on many leading UK construction industry projects. Under the Autodesk Program, Excitech will gain access to Autodesk Consulting intellectual property which will complement its existing methodologies and expertise.
www.excitech.co.uk

Allied Images to distribute Image Access technology



Image Access, a manufacturer of scanning technologies, has entered into an agreement with Allied Images, a large format scanning and printing solutions distributor. Allied Images will promote and distribute the complete range of professional Image Access wide format scanners in the UK. ***www.allied-images.com***

Ansys simulation software helps raise the roof at Wimbledon



Ansys simulation software was used to verify parts of the design of the new retractable roof over Centre Court at Wimbledon, one of the most famous tennis venues in the world. UK-based engineering firm, Advanced Computational Analysis (ACA), used software from Ansys to conduct both static and dynamic analyses of the roof to ensure that it would perform properly under real-world loads and stresses.

Five years in development, the 17,000-square foot retractable roof is an electromechanically operated structure that includes ten movable steel trusses that support a translucent, weather-resistant fabric canopy. When open, the roof sections are "parked" at opposite sides of the court. To close the roof, the coordinated electromechanical system moves the trusses apart and, at the same time, unfolds and stretches out the fabric between the trusses, until the two sections meet in an overlapping seam above the middle of the structure.

While UK construction company Galliford Try was responsible for the overall build of the 3,000-tonne roof, the ambitious project involved many expert subcontractors. ACA was charged with performing static and dynamic verification of the mechanisms that open and close the trusses.

Dr. Martyn Lacey, founder of ACA, explained, "Capita Symonds (principal structural engineering consultants) and Street Crane Express (motive control and automation specialists) had constructed three roof trusses for physical testing, but obviously it would be extremely time- and cost-intensive to build a prototype of the entire roof. So to perform a virtual analysis that would provide accurate, predictive results, we turned to software from Ansys, which ACA has used for many years as its technology of choice. Our verification process was designed to ensure that the mechanisms on each truss would perform as expected." ***www.ansys.com***

Nemetschek and Tekla sign cooperation agreement

With the ink barely dry on its agreement with Graphisoft, Tekla has signed a similar interoperability agreement with Graphisoft's parent company, Nemetschek, to improve the workflow between the company's respective specialist AEC applications.

Tekla, a specialist in BIM software for steel and concrete, and Nemetschek plan to use vendor-independent open standards for data exchange, such as the IFC standard. The two companies also plan to share their experiences with these formats and further develop them to help build an industry standard process. Furthermore, the two partners also intend to cooperate in marketing to align their product offering for multidisciplinary architecture and engineering firms.

Nemetschek subsidiary, Graphisoft and Tekla signed a cooperation agreement in September that also covered data exchange and close connection of ArchiCAD and Tekla Structures at the process level. Tekla and Nemetschek subsidiary Scia are planning to complete model transfer between Scia Engineer and Tekla Structures.

Meanwhile, Nemetschek Allplan has announced a new version of its software for facility management. In addition to modules for cleaning management, administration and workflow, Allplan Allfa is said to set new standards in interdisciplinary collaboration between planning partners. The new version supports the future format IFC (Industry Foundation Classes) and provides improved data exchange with most CAD programs.
www.tekla.com / www.nemetschek.com

Bentley unveils new community-focussed event

Bentley Systems has announced dates for a new community-focussed event that will be shaped by ideas from members of the AEC and geospatial software developer's professional networking site and User Groups around the world.

The inaugural Be Together: The Be Communities 'Live' Conference will take place May 17-20, 2010, at the Pennsylvania Convention Centre in Philadelphia. According to Bentley, the key aims of the event are to focus on increasing the skill sets of users through hands-on technology sessions, facilitate learning through product-management-led presentations, promote career and professional development, provide networking opportunities, and give access to a wide range of vendor exhibits.

Attendees will be encouraged to bring laptops loaded with live project data and personally meet with Bentley software experts and technical support teams for assistance on current challenges. Further activities will surround the Be Careers Network and its breadth of programs.
www.bentley.com


*Artist impression copyright of Kohn Pedersen Fox Associates
THE PINNACLE OF COLLABORATION

The Challenge: High-Performance Buildings

The Solution: Bentley

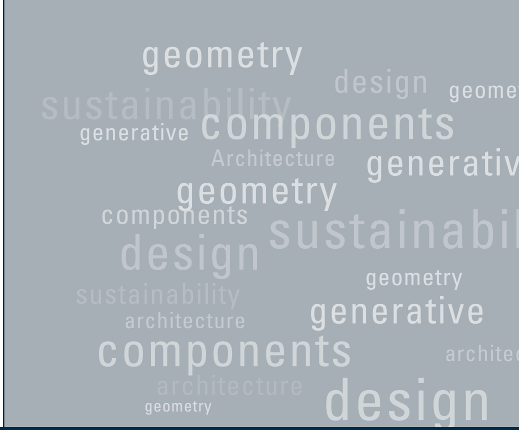



Image courtesy HKR Architects


Image courtesy CH2MHill (B-W Pantex-HVAC Design)


Image courtesy Thompson, Ventulett, & Associates

BUILDING DESIGN & ANALYSIS - BUILDING INFORMATION MODELING AND MORE

Software for the design, construction, and operation of all types of buildings and facilities around the world, from the conventional to some of the most inspiring projects of our time.

For projects small to large, simple to complex, each discipline-specific application provides an informed work environment – from conceptual design through documentation, to coordination and construction.

ENERGY ANALYSIS, DESIGN, & SIMULATION - DESIGN HIGH-PERFORMANCE BUILDINGS

Bentley's building performance software applications provide the fastest, most powerful, and most accurate design, analysis and simulation available for building load, plant energy, passive design, and dynamic thermal simulations.

Bentley's comprehensive suite of software helps professionals productively deliver sustainable high-performance buildings.

GENERATIVECOMPONENTS GENERATIVE DESIGN SOFTWARE

GenerativeComponents® (GC) enables architects and engineers to pursue designs and achieve results that were virtually unthinkable before.

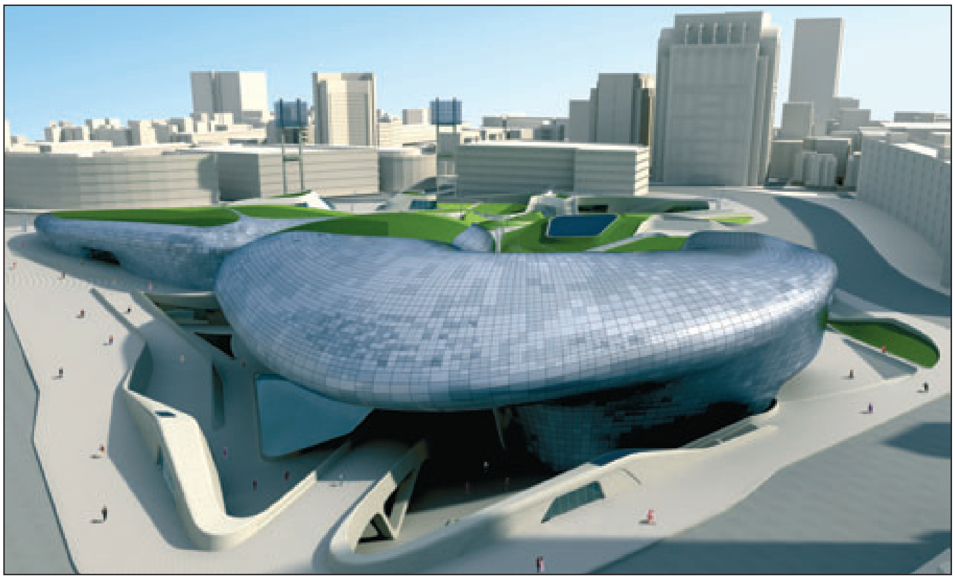
GC facilitates the delivery of inspired sustainable buildings, freedom in form finding, use of innovative materials, exploration of "what-if" alternatives for even the most complex designs.

Open a world of new possibilities while you work more productively than ever before.

www.Bentley.com/AEC/HPB

Bentley®
Sustaining Infrastructure

Zaha Hadid builds on Digital Project



Zaha Hadid Architects has expanded the deployment of Digital Project (DP), Gehry Technologies' Building Information Modelling (BIM) system based on Dassault Systèmes' Catia virtual design solution. Currently more than 10 major schemes are being developed at the practice using DP, including the radical 85,000 square metre Seoul Dongdaemun Design Plaza (pictured) that includes a museum, library and educational facilities.

Cristiano Ceccato, Associate, Zaha Hadid Architects, described how the practice applies Digital Project as a digital master system for its work. "As a single unified 3D software platform DP allows us to creatively evolve digital 3D models while retaining original design intent. It introduces a high level of concurrent design automation that increases productivity to levels that would be difficult to achieve with any other methodology. DP builds confidence at Zaha Hadid Architects by allowing us to design innovative, sophisticated, elegant structures on a grand scale in the knowledge that what we design can be constructed."

www.zaha-hadid.com* / *www.gehrytechnologies.com

Bluesky maps industrial re-development in Yorkshire

3D visualisations are being used to assess the environmental impact of a proposed redevelopment at one of Britain's industrial landmarks in the North of England. Environmental and engineering consultancy URS Corporation is using digital terrain data from Bluesky to help complete the planning for the major redevelopment project near Ferrybridge, West Yorkshire.

The Bluesky Digital Surface Model (DSM) will be used to generate a Zone of Visual Influence for Landscape and Visual Impact Assessment. Due to the location of the proposed development, it was essential that the source data was as up to date as possible and included recently upgraded motorways and intersections. Bluesky was able to offer URS a range of solutions, including NEXTMap height data, a LiDAR (Light Detection and Ranging) survey or their own off the shelf 3D model. "It soon became apparent, during early discussions, that Bluesky's own GeoPerspectives data was the only commercially available height dataset which included the specific section of the upgraded A1(M) that was critical for this project," commented Ben Stephenson, Environmental Consultant URS Corporation.

www.bluesky-world.com

Bentley delivers on Autodesk interoperability

Bentley Systems has announced the availability of MicroStation V8i (SELECTseries 1), which includes RealDWG library support and integrated 3D printing capabilities. The introduction of RealDWG follows an interoperability agreement made with Autodesk in July 2008 and will give MicroStation what Autodesk describes as 100% DWG read/write capability.

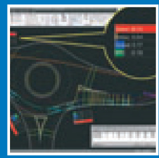
Further interoperability enhancements featured in MicroStation V8i (SELECTseries 1) include object enabler support to display data from Autodesk's ARX applications, and new reference file support for ESRI SHP, as well as MIF, MID, and TAB file formats. In addition, the software is able to produce i-models – the new "containers" for open infrastructure information exchange – and to aggregate comments registered against them in dynamic collaboration workflows. According to Bentley, these capabilities will lead to expanded information reuse, improved process and workflow efficiency, and increased project quality.

In terms of compatibility with previous generation software Bentley was keen to point out that SELECTseries updates for all Bentley products maintain forward and backward compatibility across the entire V8i lifecycle.

For more on MicroStation V8i (SELECTseries 1) turn to page 10 where Martyn Day reports from the recent Be Inspired: Infrastructure Best Practices Symposium.

www.bentley.com

Savoy and TRL join forces for roundabout design tool



Savoy Computing Services and the UK Transport Research Laboratory have joined forces to develop a new system for designing roundabouts. The system links established products, AutoTrack and ARCADY, with the intention of reducing the time taken to design roundabouts. AutoTrack Junctions is a new roundabout design program that allows engineers to design roundabout geometry interactively to selected UK or US standards.

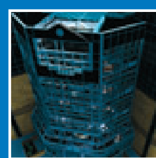
www.savoy.co.uk* / *www.trl.co.uk

Monaco gears up for visualisation event



Imagina 2010, the dedicated European event for simulation- and visualisation-based 3D design, will take place in Monaco from the 3-5th February 2010. For the second year running, imagina will host a digital village devoted to local authorities, towns, cities, regions and local governments. The Architecture & Urbanism keynote, entitled Green building: 3D simulation at the service of sustainable architecture, will be presented by architect and urban designer, Jean Nouvel (pictured). ***www.imagina.mc***

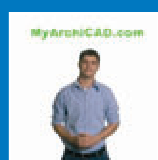
Informatix showcases new BLM solutions



Informatix Software showcased MicroGDS 11, for 2D and 3D design, and Piranesi 6, for artistic rendering, at its recent UK Customer User Group event. Looking to the future the company also presented a detailed roadmap for the development of a new range of Build Lifecycle Management (BLM) solutions. According to Informatix, these BLM solutions provide a single source of reference for all relevant data (graphical, visual, numerical, and textual) on the infrastructure and usage of a build, from concept through occupation and on to final demolition. Meanwhile, turn to page 20 for a preview of MicroGDS 11.

www.informatix.co.uk

Graphisoft launches new community website



Graphisoft has launched **MyArchiCAD.com**, a new community website that allows students, and teachers to download the ArchiCAD 13 Education version for free. Professional users can also download the ArchiCAD 13 Trial version from the same site for free. Meanwhile, turn to page 18 for a full review.

informatix
Software International
Concept · Built · Occupied · Managed

There has never been a better time to change your CAD software

Informatix Software International are releasing new versions of their CAD software solutions MicroGDS and Piranesi. As well as forming intrinsic building blocks for their integrated **Build Lifecycle Management** (BLM) solution strategy these releases are focussed on a single key objective... **PRODUCTIVITY**



Achieved through Intelligent Object handling, Parametrics and Enhanced Layering respectively, and reflecting acceptance of **buildingSMART standards**, they mirror the needs of today's economic reality.



Even the new concurrent licensing model that is associated with these products lends itself to an extremely **low cost of use and ownership**.



The current economic situation has meant that even successful Architectural firms have had to downsize to ensure stability and re-establish a firm footing for future growth. This, in turn, has prompted many businesses to review the productivility of their existing software tools.

It has been related to us by our user community that projects undertaken with MicroGDS require on average **only 60% of the manpower** an equivalent project would require using a competitive CAD software solution.

ISI would welcome the opportunity to demonstrate to potential new users just how we deliver on these productivity promises.



There has never been a better time!

MicroGDS has been used by Architects in one form or another for over 25 years, and is globally recognised from the reputation it earned on a number of high profile projects including, the Boston Big Dig, The Channel Tunnel, Heathrow Terminal 4 and The Sprint US Campus.

MicroGDS is recognised by its users as probably the most versatile CAD/BIM system on the market and with its ability to work in a true **multi-user environment** across internal, local and global offices has enabled thousands of projects to be delivered on time and on budget.

MicroGDS

piranesi
Graphical Persuader

Please contact us for more information:

Informatix Software International Limited. 509 Coldhams Lane, Cambridge CB1 3JS
Tel: 01223 246777 • Fax: 01223 246778 • Email: info@informatix.co.uk • Website: www.informatix.co.uk

Images courtesy of James Leese, John Warburton, Andrew Kuleshov, Marco Crawford

Canon's proposed acquisition of Océ to shake up wide format sector

Canon has announced its intention to buy Océ, the Dutch print company, in a deal worth €730 million. While both company's product portfolios are extremely broad – from digital cameras and home printers to book printing and on-demand newspapers – the proposed move is certain to have a major impact on the wide format printing sector.

Océ has traditionally been strong in production-level wide format monochrome printing and copying, while in recent years Canon has invested heavily in its wide format inkjet products. The deal would provide Canon, with a top to bottom wide format product range for the Architecture, Engineering and Construction (AEC) sector, which would be unique in the marketplace. It would also give Océ access to Canon's well-established sales and marketing network throughout Asia and provide both companies cross selling opportunities in Europe and the United States.

The proposed deal is sure to grab the attention of HP, who has been hugely dominant in the wide format inkjet market for many years, but does not have a wide-format monochrome printer offering. According to Reuters, SNS Securities, a Dutch investment banking and securities brokerage firm, said that Hewlett-Packard and Kyocera would have sufficient financing options for a counter bid. However, there have been no indications that a counter offer will materialise and Rokus van Iperen, chief executive of Océ, declined to comment on the possibility of such bids.



Canon's proposed acquisition of Océ would give the Japanese company access to Océ's extensive wide format monochrome print technology.

Following the completion of the merger, Océ has said that it will remain a separate legal entity and will become a division within Canon with headquarters in Venlo (the Netherlands). ***www.oce.com / www.canon.com***

Autodesk and Intergraph shock plant design sector

In a shock announcement this month Intergraph and Autodesk have made public an agreement to allow Autodesk to embed Intergraph ISOGEN into AutoCAD Plant 3D.

Autodesk's aspirations in Process Plant have been accelerating over the past five years. It first partnered with UK developer Aveva, when its aim was solely 2D. However, a recent step in the creation of the newly available AutoCAD Plant 3D weakened the bond, putting the firms in greater competition. Now Autodesk has partnered with plant giant Intergraph - a move that will surely shock their competitors.

ISOGEN extracts and generates piping isometrics, bills of materials, fabrication information and has about 50,000 users worldwide. With 80% of the world's ISO drawings created in ISOGEN it is considered the industry standard. The deal also means that users of Autodesk Plant 3D, Intergraph PDS and SmartPlant, and other major plant design products can easily share information.

Autodesk has always said it would sooner license or buy technology than create it from scratch. Here, Autodesk has partnered with a firm that has been a major player in the plant market for decades and has removed serious barriers to entry in the highly competitive 3D market.

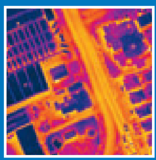
If anything, the agreement shows Autodesk is serious about being a contender and more interestingly that Intergraph is willing to make an alliance with the biggest shark to enter the plant market in years. Could Autodesk ultimately buy Intergraph? As we have seen in AEC and design visualisation, when in a market the company will acquire to dominate.

www.autodesk.com/plant / www.intergraph.com

New AEC (UK) BIM standard made available

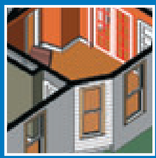
The AEC (UK) standards committee has announced the Phase 1 release of its new BIM Standard documents. The standard, targeted at companies migrating from CAD to BIM, is said to provide a practical & pragmatic BIM standard for the Architectural, Engineering and Construction industry in the UK. It includes protocols and procedures for: central and project resources, model naming, object naming, drawing composition for CAD/BIM and 100% BIM workflows, spatial co-ordination, component modelling, data exchange and more. The committee members include architects, civil, structural and MEP engineers, multi-disciplinary firms and technology consultants, representing a broad cross section of the AEC market. ***www.aec-uk.org***

Bluesky launches property heat loss mapping tool



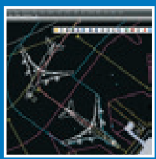
Aerial survey company Bluesky has launched a property heat loss mapper to help Local Authorities view thermal data collected during airborne thermal imaging surveys. The HELIOS (Heat Loss Investigation System) web based reporting tool, developed by Manchester Geomatics, will help energy and environment teams understand the results of thermal surveys and allow cross referencing of data with other information. ***www.bluesky-world.com***

Autodesk Inventor provides BIM-ready product models



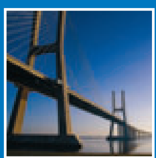
Building product manufacturers, including Reilly Windows & Doors and Mestek, are using Autodesk Inventor to collaborate with AEC firms. By providing 'BIM-ready' product models that can be directly incorporated into the building design and construction process, product manufacturers are aiming to help AEC firms make better design decisions around constructability, fit, aesthetics, performance and cost, while increasing their own ability to win new business. ***www.autodesk.com/inventor***

Transoft Solutions updates airside design tool



Transoft Solutions has launched a new version of its software used for carrying out aircraft turn simulations and swept path analysis in order to evaluate spatial requirements at stands, aprons, taxiways, runways, and other airport facilities. AeroTURN 3.0 features enhanced simulation and turning capabilities and is compatible with 32- and 64-bit versions of AutoCAD 2010, MicroStation V8i, Windows Vista, and Windows 7. ***www.transoftsolutions.com/AeroTURN***

Civil 3D bridge modeller goes live in Autodesk labs



Bridge Modeller for AutoCAD Civil 3D 2010 is a new technology preview from Autodesk, and is available now on the company's Labs website as a free download. Designed to enable highway engineers and bridge engineers to create simplified bridges directly from a Civil 3D corridor object, the software is derived from Bridge Extension for Revit Structure 2010, which in itself offers more robust bridge modelling capabilities. ***labs.autodesk.com***



Bentley BE Inspired 2009

After Bentley Systems' annual customer event, BE, was cancelled this year due to the economic conditions, the company held an intimate summit in Charlotte, North Carolina, to announce its news and the winners of its annual infrastructure awards. **Martyn Day** attended the event.

Traditionally Bentley's BE event attracts thousands of customers from around the world to hear the latest in design and management technology, attend classes, meet the programmers and have some quality social time. These huge user events take years to organise and unfortunately the financial crisis struck during the planning stages for the 2009 event. This has impacted the majority of global infrastructure projects with the net result of losses, redundancies and Bentley's customers imposing stringent travel restrictions inhibiting their ability to attend software jamborees.

As an alternative, Bentley held a small, invite only event in Charlotte, North Carolina, in October, to deliver its keynotes and updates and host the gala evening for the company's annual BE Inspired awards. So instead of 3,000, we were just 300 but the hospitality and information was far from Spartan.

Happy Birthday

This year also happens to be Bentley Systems' 25th anniversary. This is a major milestone, especially when the Bentley's reminded us that the company has only changed the DGN file format once in its history — not, as Greg Bentley pointed out, multiple times like its competitors to drive sales. Bentley started out with brothers Keith and Barry Bentley developing a package they called PseudoStation to allow users of Intergraph's VAX systems to view and modify their designs on general-purpose workstations.

With the rise of the PC, that product became MicroStation and what was a small family business became a global giant, employing 2,700 people (including three more Bentley brothers) in 50 countries with annual revenues over $500 million.



Greg Bentley, CEO, left, and Keith Bentley, CTO, were on hand to host attendees, as well as to celebrate 25 years of MicroStation, DGN and Bentley Systems.

Left: *The 112-storey Lotte Super Tower proposed for Seoul, South Korea, is a 550-metre-tall, mixed-use building with a steel diagrid structural system. The exterior structural diagrid has 68 unique (432 total) joints at which six major members come together at a single point. Morphing from a square base to a circular top, the building geometry posed a technical challenge for the structural engineering team.*

The team developed custom tools to manage the diagrid connection geometry, enabling it to create accurate physical and analytical 3D models of the structure. MicroStation and Bentley structural software provided the main interface to the custom application used to parametrically describe and manage the node connections. The 3D model supported creation of 2D and 3D drawings and the provision of accurate digital information to the steel supplier/fabricator.

These numbers make Bentley one of the biggest privately held software firms in America and number two provider to architecture, engineering, construction and GIS/geospatial markets.

Bentley's product range has expanded by development and acquisition and includes famous brands such as ProjectWise, InRoads, STAAD, Generative Components, AutoPlant, Hevacomp, PlantSpace, Haestead and RAM.

Bentley's products and customers tend to be at the larger scale of the engineering business, servicing 86% of the Engineering News Record's Top 500 design firms.

To cater to its customers Bentley has established the most extensive back office system out of any of the CAD vendors, having a server-based access to and distribution of software, training and support, as well as offering flexible licenses to mix and match product sets as and when required.

The company's key product is still MicroStation, which has undergone continual development since its inception in 1986 and has grown from being a 2D drawing system to a full 3D modelling tool used to prototype everything from the most complex signature architect's buildings to bridges and massive road and rail networks. Twenty-five years later and, from the event's news, Bentley looks set to keep gong strong.

Greg Bentley

It has undoubtedly been a tough year but Greg Bentley remained upbeat about the opportunities for the Infrastructure market and the company. There is a lot of talk in the US about stimulus money and it appears some of this is trickling through, especially to rail and road networks — areas where Bentley dominates.

In the last 25 years, Bentley has spent over $1 billion in research and development, building an extensive portfolio of products across multiple markets. While the development continues, so do the acquisitions, with Bentley announcing at the event that it is purchasing Bridgemaster, the leading bridge design solution in the Chinese market, as well as gINT Software, which extends data management of Information modelling below the surface for new Geoenvironmental opportunities. Greg Bentley also announced the acquisition of 9SQ Corporation, a South Korean-based developer of plant services, adding its PlantWAVE products to the Bentley portfolio, which brings clients like Daewoo Shipbuilding, Hyundai Heavy Industries and Samsung Engineering.

Bentley has moved to allow customers to pool licenses at a country-level. This is a great cost-effective change to the company's licensing policy, which previously only allowed site-based license sharing. There is also a new Passport annual licensing option for individuals, which includes extensive bundles of Bentley's high-end products.

Keith Bentley

In his address, Keith Bentley took a trip down memory lane and looked at the company from when it just had two employees, together with some of the very early versions of MicroStation, which was pretty amusing.

Keith then examined the federated workflows that dominate the Infrastructure space. Customers use all types of software, with many different formats, many different standards over multiple places. Despite all the technology available, it is a tough place to operate in and because of this Bentley is concentrating on trying to improve the connectivity and interoperability between software and companies. As part of this



Extending and adding new runways at Chicago O'Hare International airport, while keeping it fully open, has been achieved using ProjectWise.

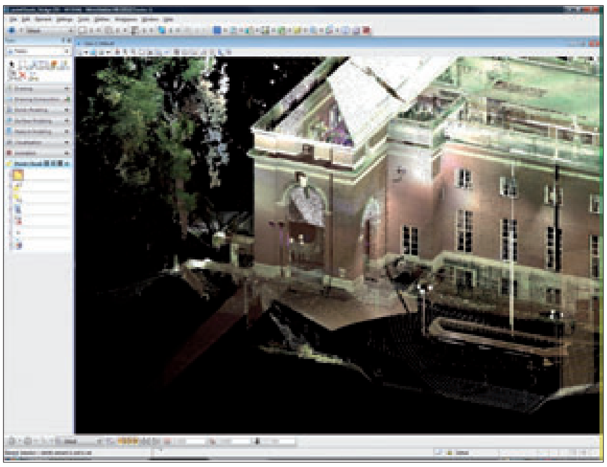
strategy, Bentley has come up with an intriguing new format to store project data called an 'i-model', which is essentially an expanded DGN file.

Bentley's product suite has been expanding in scope and reach from 2D to 3D, analysis to project management and this is set to continue. The company sees an expansion in the use of point cloud data and has signed an agreement with London-based Pointools to include its technology in future Bentley products. This deal is in addition to the existing deal that Bentley has with Leica for its CloudWorx software.

Looking towards the future Keith Bentley pointed out that just after they had started the company, he needed to buy a back up drive and paid $2,000 for a 'huge' 10Mb drive. His wife's laptop recently died and while it originally had a 200Gb drive he had to order a 500Gb replacement for $89 as the 200Gb drive was not made anymore. Keith Bentley mused that if he had wanted 500Gb of data storage in 1986, it would have cost him $100 million! The prices of computing continue downward, while the power and storage on the desktop continues to accelerate. The future is multiple cores and one day we could see affordable desktop computers with as many as 1,000 cores, he suggested.

While there has been a lot of talk of the cloud, Keith Bentley could see that some services would perhaps move to an Internet-delivered service but did point out that with Bentley's Select subscription and server delivery, Bentley's products and infrastructure were already, in some way, software as a service.

Offstage, Keith Bentley divulged a secret: he had bought himself an Apple iPhone. Keith Bentley is not traditionally an Apple hardware fan, but he could not help himself extol the virtues of the iPhone and how it is so good he threw his Kindle reader away (metaphorically) and now even reads books in bed on it. I would not hold your breath for an OSX version of MicroStation anytime soon but I would not be surprised to see Bentley 'have an app for that' in the near future.



One of the big announcements, the licensing of Pointools, the world's fastest point cloud data engine, will enhance MicroStation's ability to display and manipulate laser-scanned data. Here, a colour point cloud laser scan of a building and a LiDAR aerial image of terrain are easily displayed inside MicroStation.

Pointools

At the event, Keith Bentley announced that it has entered into a technology agreement with Pointools, a leader in high-performance point cloud manipulation. Point clouds are literally a cloud of 3D points, captured by 3D laser scanners and can be used to accurately capture infrastructure assets such as plant, buildings and roads, as well as land from aerial LiDAR (Light Detection And Ranging) surveys. The agreement allows Bentley to license Pointools' Vortex API engine, together with ongoing upgrades, for incorporation in to MicroStation and all other software products that use Bentley's platform technology.

The Vortex engine is widely renowned as being one of the fastest engines for point cloud manipulation and can typically handle datasets of 50Gb or larger within 3Gb of RAM on a laptop, providing real time interaction with literally billions of 3D points. Bentley feels that point cloud data will be an important data format in the future, as the price of laser scanners drop and there is an increased need to refurbish and renovate existing infrastructure. Greg Bentley explained that AEC workflows have, up until now, been in the early stages of leveraging laser scanning but believes that the software has been the constraining factor in realising the potential value of point clouds. He believes the Bentley/Pointools agreement represents that needed breakthrough. MicroStation users will be able to seamlessly reference huge point cloud files and leverage digitally captured existing as-built conditions for improved lifecycle performance.

Faraz Ravi, Pointools founder and director was on hand at the event to co-announce the technology partnership. Ex-architect turned programmer, Mr Ravi said the Pointools Vortex engine is similar to the Parasolid modelling engine already incorporated in MicroStation and will allow users to uniquely reference and geospatially co-ordinate point cloud files within the context of standard vector geometry and raster data. Pointools engine will be integrated into MicroStation and other Bentley applications, enabling users to overcome the disconnection of having to use stand-alone point cloud editors, directly supporting point clouds from vendors including Leica, FARO, Topcon, Riegl and TerraScan.

While talking with Mr Ravi in a hallway, a number of Bentley customers came up to find out more about what they were going to get in the forthcoming

MicroStation. It seems that a number have opted to purchase other software solutions that cost up to $15,000 and which they described as slow and system hungry, now they will get a faster solution, for free as part of their core MicroStation.

i-model

The main announcement from internal development highlighted that Bentley is serious about resolving collaborative workflows.

While ProjectWise document management is one part of the puzzle, Bentley recognises that there is a federated and somewhat 'walled' nature between project participating firms.

With CAD modelling tools now delivering Information beyond dumb geometry (that is the 'I' in Building Information Modelling), there is no standard interchange format that is extensible and covers all the information accurately and intelligently. While still a strong supporter of Adobe's PDF format, Bentley has created a new open 'wrapper' format, called 'i-model' that can better understand industry needs and workflows, especially within a BIM environment.

The key benefits of this new wrapper is that it is highly accurate for both 2D and 3D formats, offers bi-directional links for data to be taken back to the original CAD file and is self describing needing no additional application to display its content.

Bentley has a new term that it applies to i-models, saying that they have 'provenance', which means that an i-model always knows exactly where its original constituent files are and how it has evolved throughout the design process. This makes i-models self-managing.

While the data is lightweight, it is still highly accurate, the format supports digital rights management and digital signatures for control. The i-model files can also be time limited for granting 'windows of access'. The high degree of accuracy means that clash detection, which can be done in Project Navigator, is not as suspect as other lightweight collaboration formats that approximate geometry using faceted models.

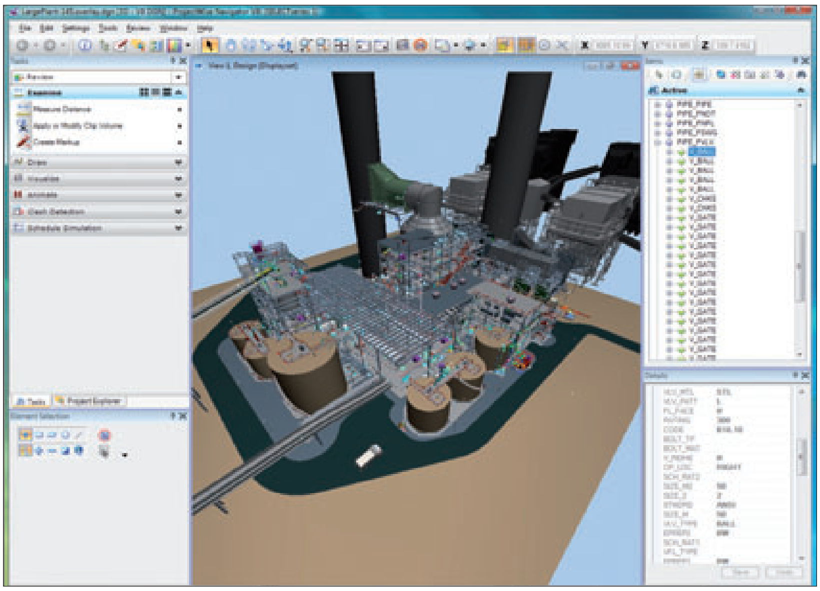
On large projects this approximated geometry can introduce poor results when tolerances are taken into consideration.

Users can export i-models from within MicroStation or other Bentley products. Bentley has also created a free i-model export plug-in for Autodesk Revit. For those without CAD systems, there is also a stand alone ProjectWise i-model Composer product, which can be used to import models and data from a variety of commonly used sources, packaged up and saved as a single i-model. Bentley describes the system as 'open' and has created an API development kit.

The i-models are optimised for purpose, enabling streamlined information exchange between collaborating teams. An i-model can also be data-independent and used to store information in multiple industry standards including CIS/2, IFC, and ISO 15926.



One of the competition winners, Edge Structures' fantastic sliding roof at Wimbledon Centre Court, designed in MicroStation. A sensitive and emotive project that has meant that rain no longer stops play.



Bentley has been concentrating on developing collaboration solutions for digital and paper-based workflows. The new 'imodel' technology further expands our options.



They are customisable to include the preferred level of information richness for different project and workflow uses.

The only weakness I could find in this idea is that at the time of launch no other vendor supports i-models. If this is to go beyond just Bentley workflows, it is essential that other vendors in the industry support export to the i-model format.

Bentley's collaboration tools receive a boost with an update to ProjectWise Navigator. Offering dynamic collaboration, analysis, clash detection, rendering and animations.

Project Navigator V8i

ProjectWise and Project Navigator have both been updated to handle the new i-model format, enabling Project Navigator to offer a broader and expanded role in federated workflows.

Buddy Cleveland, Bentley senior vice-president, Platform Technology, explained that even the best tools bring together a broad range of file formats but only enable static visualisation to identify problems. Bentley is trying to improve the technology by adding a dynamic element to Navigator and document the feedback that is added to project data as it is shared.

ProjectWise Navigator V8i can open DGN, DWG, and i-models, while 3D models can be manipulated in real-time, apply analysis measure and mark-up. The software allows the optimisation of schedules and





FCBS won Innovation in Generative Design category for its roof design of the new Worcester Library and History Centre, which provides ventilation. Using Generative Components, the team could alter multiple variables to create a sustainable design.

has built-in clash detection. The rendering technology produces very good photorealistic rendering and outputs 2D/3D PDFs.

Navigator is obviously designed to work well with Bentley's ProjectWise collaboration servers, which when combined offer additional services, such as notifying team members of any changes to their work.

It is clear that with this offering, Bentley has Autodesk's Navisworks in its sights, as Autodesk dramatically increased the Navisworks price to £10,000 for a full copy. As the number of team members that need this functionality increases with the size of the project, Bentley is pitching the ProjectWise collaboration servers and Navigator for considerably less, with many added benefits.

Awards

The glue that held the event together was the competition and awards evening. Post judging and prior to the ceremony, the attendees spent a few days listening to short presentations from each of the competition entries, showing how the software was used to complete the projects.

The variation in project scale and scope was quite diverse but the high standard to which the professionals were using CAD tools was really inspiring. Every presentation was given in 3D and not just for visual effect, these firms were getting the multiple benefits of building virtual models as digital prototypes. There were many presentations that were not visually rich, such as the changes being made to Chicago O'Hare airport, but the complexity of extending and amending an International airport and central hub while keeping the planes flying was an exceptional feat.

A number of UK firms were on the winners' list: Mott MacDonald won the Communicating through Visualisation award for its model railway project, Feilden Clegg Bradley Studios won Innovation in Generative Design for the roof of Worcester Library and History Centre, and Edge Structures won the Innovation in Structural Engineering award for the brilliant Wimbledon Centre Court Redevelopment and Retractable Roof project. The Brits also won loudest tables at the gala dinner award, which has become a bit of a tradition!

Conclusion

The traditionally huge gatherings of CAD firms are always impressive but also always very impersonal. With only 300 people it takes on a very different dynamic and there is much more fusion between attendees, with lots of opportunity for interaction. I understand Bentley may well keep this event in addition to the huge BE conference next year, which will be in Bentley Systems' hometown of Philadelphia. I also believe it may be broadcast live over the web.

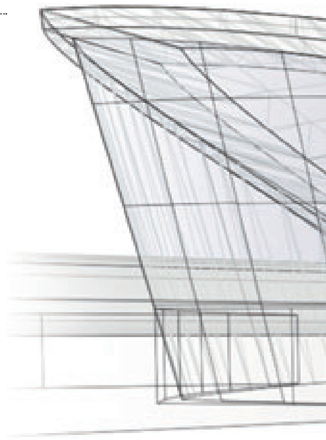
With the focus being very much on the projects of Bentley's customers, it was really inspiring to see 3D, analysis, rendering and project management tools being used everywhere at all points of the design process. The key takeaway from these users was that 3D meant all details of the project were explicit, which aided communication and understanding in the traditional and federated workflows that permeate our market.

As to the announcements, Bentley is certainly listening to its customers and trying to ease the pain points in collaborative working with the updated Navigator and i-model technology. Last year's introduction of Dynamic plot, which cleverly linked paper plots and mark-ups back to the digital model, was a key link. This new i-model format really builds on the digital process, as it is aimed at trying to overcome the problems that file formats always create, as well as solve future problems with evermore information added to design formats. We will have to see if the i-model format is accepted outside of the Bentley community for it to be called a success.

As usual, Bentley is a very technology driven company, being founded by the programming brothers. Twenty-five years on, Keith, Barry, Greg, Ray and Scott Bentley are still in Exton, developing MicroStation and frequently on the forums helping customers.

While what it has managed to create is sometimes not particularly obvious to those outside the MicroStation community, the company tends to develop elegant solutions on an ambitious scale, especially with respect to customers' workflows and data over the long term. I have said it once and I will say it again, Bentley has only changed its file format once in the last 25 years and that takes some planning.

www.bentley.com



Introducing Bonzai3D

For decades Computer Aided Design tools concentrated on the 2D documentation phase of the design process. More recently, Google SketchUp has highlighted the demand for 3D conceptual design tools, which has lead to the development of a number of competitive systems, **Martyn Day** reports.

Prior to SketchUp the architectural market was pretty much concentrated in the production of detailed drawings. Despite products like Autodesk's AutoCAD and Bentley's MicroStation having 3D architectural flavours, only a handful of customers bothered to exploit the 3D capabilities. They were essentially expensive 2D symbol libraries. Even when Autodesk bought Revit, a fully 3D Building Information Modelling (BIM) system, the effort to get adoption appeared Herculean with architects very much stuck in the old ways.

Meanwhile, in a cabin in Colorado, the creators of SketchUp, @last software, had been building a small but die-hard fan base for its light, easy-to-use conceptual modelling tool. Funded by venture capitalists and some seed money from the CIA, @last fostered a growing relationship with its small but loyal base. Then Google, the Internet Behemoth, surprised the CAD market and bought the company to enable users to create 3D models for its Google Earth project. More importantly, Google also made SketchUp a free download.

The resultant explosion in 3D usage pretty much changed the AEC industry for good, with many architects investing time learning how to model. All the major CAD vendors have to thank Google for this kick-start to the adoption of their 3D products. As a result SketchUp is now endemic in the AEC industry and growth of all the vendors' high-end 3D systems is now well and truly under way.

While Google does update SketchUp, it has not really kept up with the demand for additional functionality that experienced architects and 3D users are now demanding. SketchUp can easily produce simple rectilinear forms but more complex designs require a level of skill that only comes with hundreds of hours of use and even then is not CAD accurate. This has opened the market to other developers, which while not offering products for free, are in a price band that most can afford. On my travels around architectural firms, the most popular product I am seeing is Bonzai3D by AutoDesSys also creators of the 3D modelling and rendering tool, FormZ.

Bonzai3D

A Bonzai is a tiny tree and I guess here, Bonzai3D is a diminutive version of AutoDesSys' FormZ modelling tool, which competes with the likes of Autodesk's Maya and 3ds Max. While all those products are very capable, they are complex and feature rich due to years of development. Bonzai3D is a simple, easy and quick conceptual modeller, which can be applied to any market that needs freeform NURBS (Non-Uniform Rational B-Splines) surfaces. It also comes with a useful menu specific to architecture: walls, windows and staircases that can be dragged/dropped and easily resized.

The interface is very user friendly and self-explanatory. While it does not really innovate here, in that it still feels like a modelling tool, Bonzai3D really captures the modelling process well, making it highly intuitive, with no surprises. For those unfamiliar or needing help the company provides video tutorials on its website to speed up familiarity and confidence.

The drawing space is similar to SketchUp and there is a broad suite of modelling tools to select from the side menu. It is very straightforward to jump in, sketch and extrude and apply real-time Boolean operations adding and subtracting volumes. Bonzai3D provides many automated drawing guides, rapidly speeding up modelling. Here, there is a great offset command that makes it really easy to create walls very quickly. SketchUp users will feel at home here and will be incredibly impressed with the speed and breadth of modelling tools.

To move away from rectilinear 'boxy' design, Bonzai3D's NURBS engine is a breath of fresh air, with a large number of ways to create and edit forms, either from scratch or convert old geometry into NURBS entities. Using 'grips', geometry can be manipulated (push/pull) in real-time and texture maps can be applied to these complex surfaces.

Geometry can also be twisted, bent, bulged and tapered into any shape. These transforms can be added to the same object in real time.

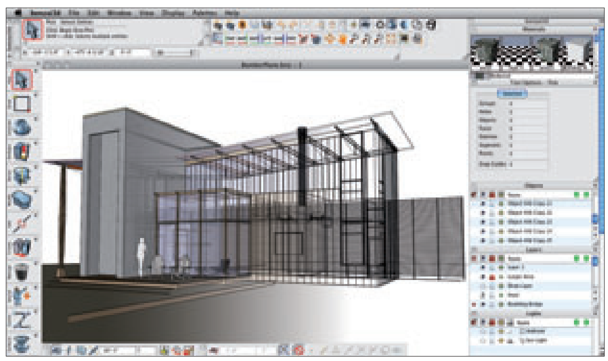
There are 'speciality objects' that automate geometry such as the roof and complex stair design, providing, for instance, a parametric roof that can be altered after it has been created.

Bonzai3D also provides contour design capability for topological models and these can create meshed or triangulated models. It is really easy to create live sections of the models too with a simple point and click approach in any combination of x,y,z.

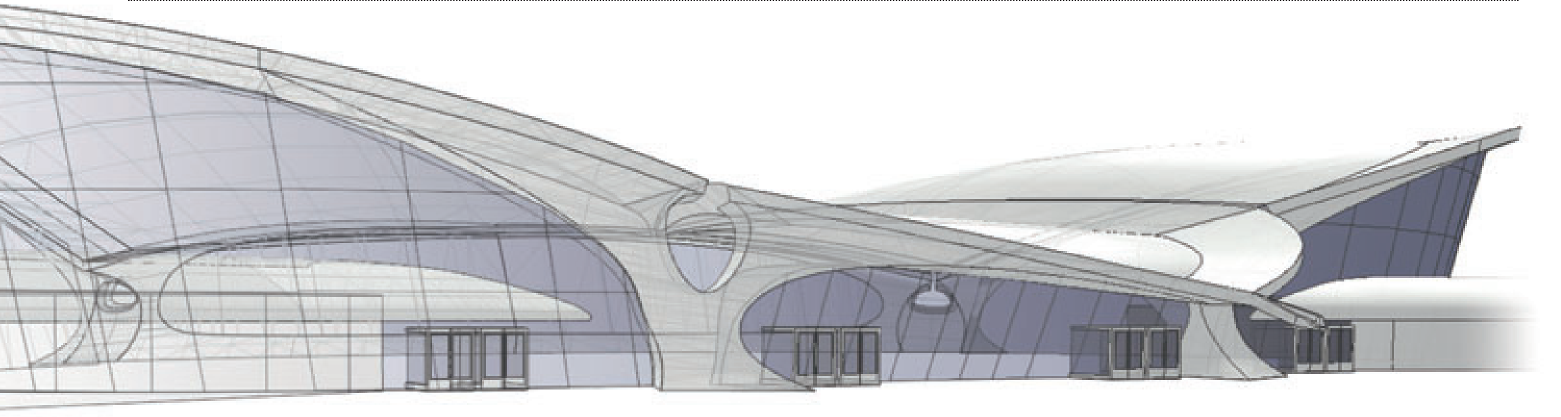
Bonzai3D comes with content libraries, people, trees, and furniture, which can be added to align



For those that do not need freeform surfaces, Bonzai3D is just as good at standard planar geometry with its built-in rendering engine providing easy on the eye results.
House modelled by Markus Bonn, AutoDesSys.



Bonzai3D has a very clear interface with an amazing depth of capability for a product at this price. It is by far the most impressive standalone conceptual modeller that AEC Magazine has played with.
Jackson Family Retreat by Fougeron Architecture. Modelled by John Pollard, AutoDesSys.



with the view. Doors and windows automatically create holes when inserted into the model. It is even possible to insert models from Google SketchUp's 3D warehouse directly into the software.

The Import and Export options cover 20 major formats such as DWG, DXF, KMZ, 3D Studio, LightWave, and OBJ. It is also possible to import the 2D satellite data from Google Earth into the modelling session, or the reverse and take the 3D model into Google Earth via the KMZ format. Bonzai3D also supports the ability to bring images into the background to produce in situ renderings, matching the view and perspective.

The software comes with hundreds of pre-assigned materials to work with its real-time rendering engine. Texture maps can be scaled and oriented live within the workspace to get the best result and here the software will apply the best texture mapping solution based on the geometry (cylindrical, spherical, cubic, flat and parametric). Bonzai3D is available for Windows and Apple Mac.

Those familiar with Google SketchUp will be very impressed with Bonzai3D's ability to model precision freeform surfaces. The good news is that it is just as easy to edit the geometry too.

JFK Terminal by Aero Saarinen. Modelled by John Pollard, AutoDesSys.

Conclusion

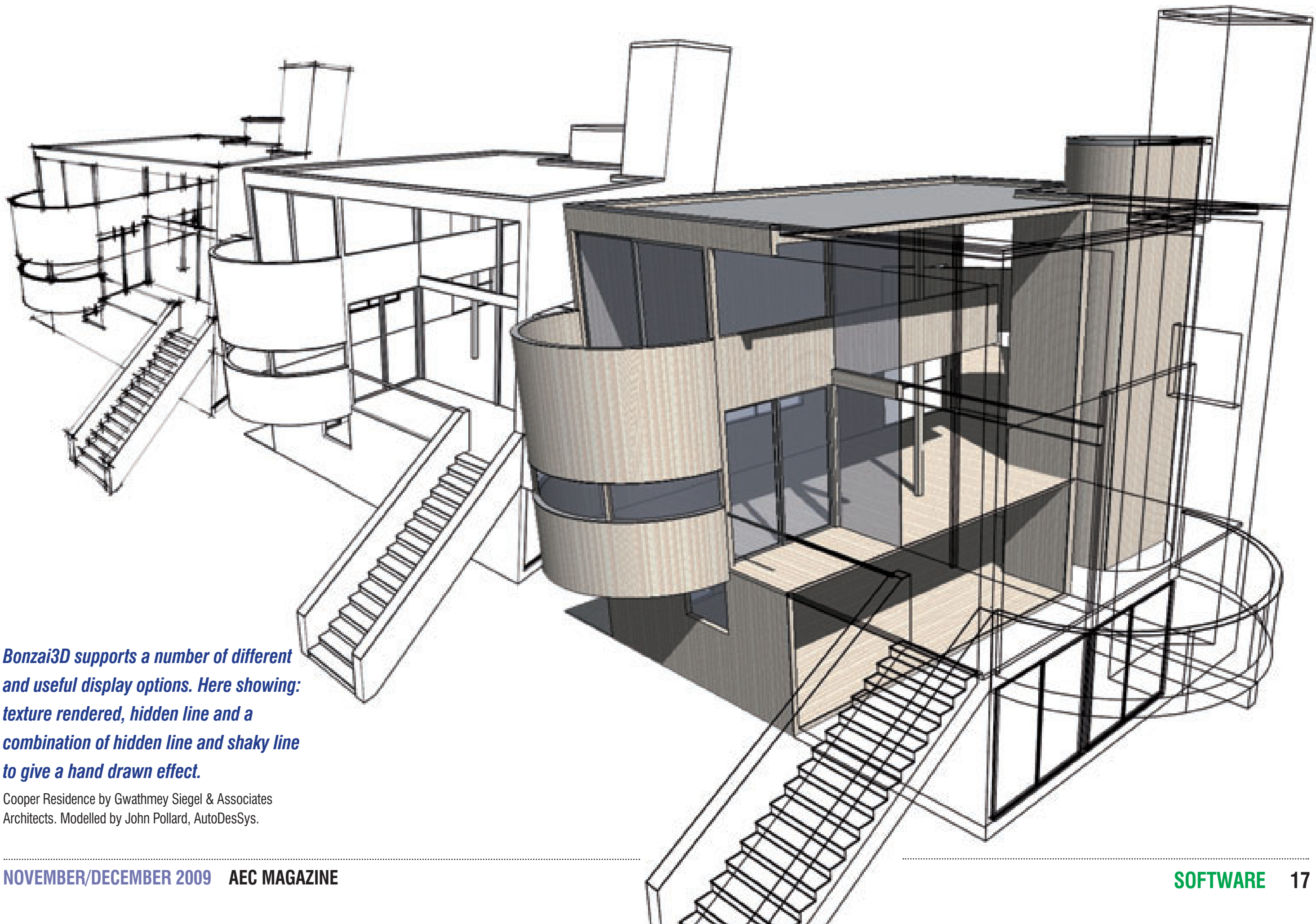
The 3D conceptual design market is going through an interesting phase, for not only have the main CAD vendors added freeform modelling tools to their core applications but Google's SketchUp is also undergoing a transition. Since the introduction of Google StreetView technology, capturing the continual facades of every street, Google's need for SketchUp to populate its maps has partially declined. Recently the SketchUp development team announced that it was pulling support for Autodesk's DWG file format from the free version of the application, opting to only provide 'professional' functionality in the paid-for SketchUp Professional version. Google's move to migrate customers to fee-paying copies potentially opens the market up to other vendors' products such as Bonzai3D, which offer a lot of bang for the buck.

Bonzai3D may not be a complete replacement for SketchUp because of all the knowledge users have developed in that product, as well as the sheer breadth of add-ons its community has spawned, guaranteeing it a place in the architect's armoury. However, Bonzai3D is a brilliant modelling and sculpting tool for the price. The freeform geometry and rendered visuals that can be generated is really only available in products such as Rhino (£995) or the equally amazing Moment of Inspiration (MOI) software ($195).

Version two of Bonzai3D is under beta development and I look forward to seeing what additional functionality AutoDesSys will add. For now the lack of dimensioning is the only drawback — and this is something that Google is adding to SketchUp Professional.

Auto-de-sys is offering a 30-day trial with a wealth of online tutorials to quickly get any user up and running and is well worth the investment of time. There is also student and education-priced versions. A full license costs £369.

www.bonzai3d.com; http://moi3d.com
http://sketchup.google.com

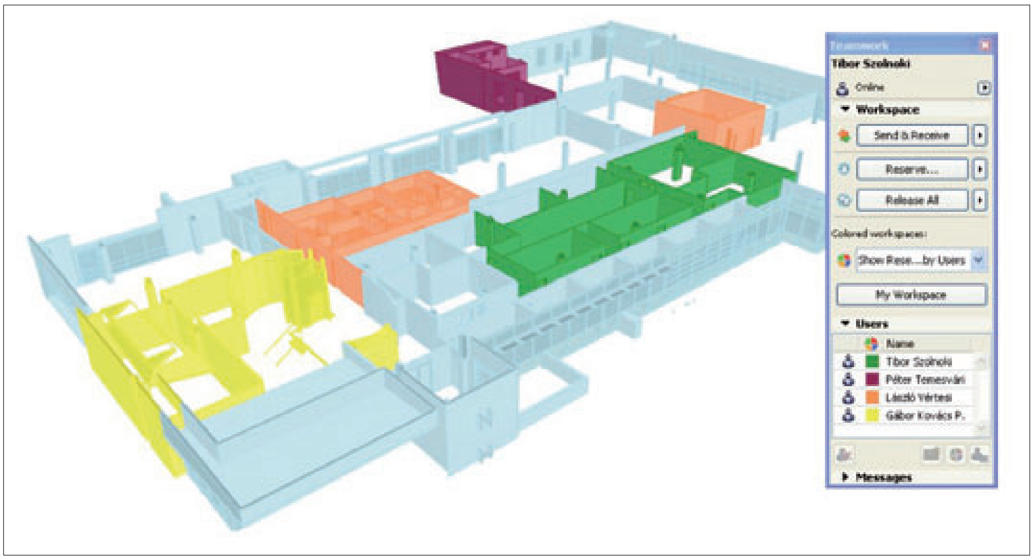


Bonzai3D supports a number of different and useful display options. Here showing: texture rendered, hidden line and a combination of hidden line and shaky line to give a hand drawn effect.

Cooper Residence by Gwathmey Siegel & Associates Architects. Modelled by John Pollard, AutoDesSys.

Graphisoft ArchiCAD 13

In the latest version, ArchiCAD 13, Graphisoft has delivered the most impressive array of improvements and enhancements to its architectural Building Information Modelling (BIM) system in the product's history. **Martyn Day** reports.



The new teamwork capabilities allow users to reserve only the minimum needed parts of the model to carry out their work. A coloured view of the workspace gives an instant picture of which project member has reserved specific geometry.

Originally released in 1987, ArchiCAD has always been both a 2D and a 3D architectural design solution, five years ahead of Autodesk's acquisition of Revit. While 13 may be unlucky for some CAD vendors, Budapest-based Graphisoft has eschewed superstition, releasing the thirteenth version of the original desktop virtual building solution for architects this month.

Graphisoft is heralding this as a revolutionary release, mainly in the way it allows project teams to work together on the same model. There is also a host of improvements and new features that will make its existing customers think that Christmas has come early. It is certainly a crowd-pleasing release.

Before going into this new version in detail I want to backtrack and examining just how these BIM products came to be developed in the first place. The AEC CAD market is and has been predominantly 2D, with products like AutoCAD dominating the core construction disciplines. There were a number of very expensive, rudimentary 2D/3D systems like Sonata and GDS that were used (mainly by London practices) but these proved too expensive and too limiting. For many architects CAD became a replacement for the drawing board and construction went back to a flat design world.

The Mechanical/Manufacturing industry followed a similar path but despite the cost, continued down the 3D route. The advantages of modelling over drawing symbols is that designers can explore, analyse and run simulations — a benefit not lost on product and mechanical designers. However, Graphisoft was the one architectural developer that never lost faith in the vision of 3D architectural modelling and despite what the majority of the market was doing, managed to build a decent-sized business across Europe, selling to enlightened 3D architectural firms.

Meanwhile, Revit's origins were from this mechanical CAD world where two programmers at PTC Corporation (developers of Pro/Engineer), created a new parametric modeller that, despite considerable immaturity to ArchiCAD, was snapped up by Autodesk.

Both these key BIM products returned to the core concepts of those early expensive 3D systems but benefited from modern programming methodologies, faster processors and graphics, more memory and lower cost. Both products allow architects to design in 3D providing all the 2D general assemblies 'on demand' as a dividend of the 3D process.

While the take up of BIM was slow at the start, the popularity of products like the free Google SketchUp showed the benefits of 3D to many architects, which ultimately helped kick off a migration to 3D for the construction industry.

Creating a BIM solution is a massive software development task and it is always a work in progress. BIM systems need to have components like walls, doors, windows, floors, slabs, roofs — allowing for all the variations that architects use — as well as fixtures and fittings. Then there are structural elements, MEP components, site tools as well as flexible 2D output.

Most BIM solutions have concentrated on the content and core design capabilities of the software, with hardly any attention spent on developing ideas for workgroups and allowing multiple designers work on the same model, which in a collaborative multi-firm environment is a major drawback.

The solutions required the user to have multiple models, or segment models up or zone off inappropriately large chunks of geometry to make edits. All the packages 'clunked' when it comes to project teams; none of the BIM developers had a proper solution to sharing the model data, until now.

Teamwork

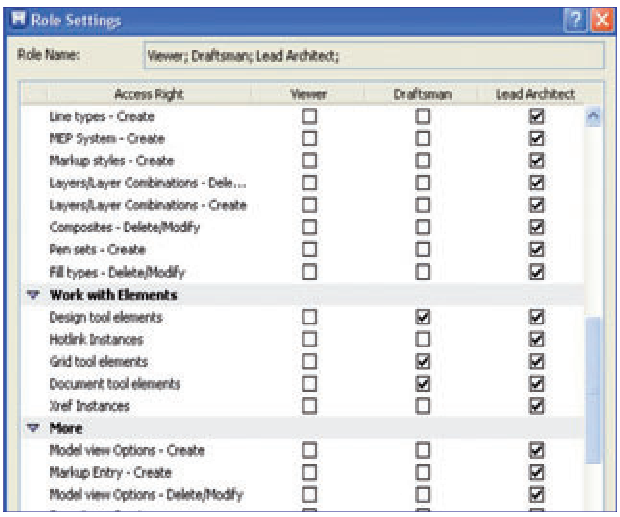
ArchiCAD 13 introduces the most elegant and simple solution for team working I have ever seen. ArchiCAD now allows multiple designers to work on the same model at the same time, without the need for carving a project up.

Based around the new Graphisoft BIM server, any number of designers can all work off the same model, the same library of parts. Using a client server approach all the data is secure and there is only one master model. Keeping things very simple, administrators set up project teams with job roles and access rights, allowing the server to co-ordinate model transactions and user-rights.

After logging in and the first transaction of the model data, only changes are sent across the system. Data streams are in kilobytes, which can be sent within an office building or across the Internet. The user can send or receive any changes at will or wait for automated checks.

Selection of geometry is simple. Using the Teamwork dialogue, simply click on geometry that needs editing and press the reserve button. The geometry will be reserved on the server and will turn a specific colour for each designer. There are also powerful filter commands to mass select elements and zones for reservation — perhaps to change all the fire doors on a floor or in a building. It is possible to work online or offline with reserved geometry or zones, allowing for times where there is no Internet connection, like on an airplane.

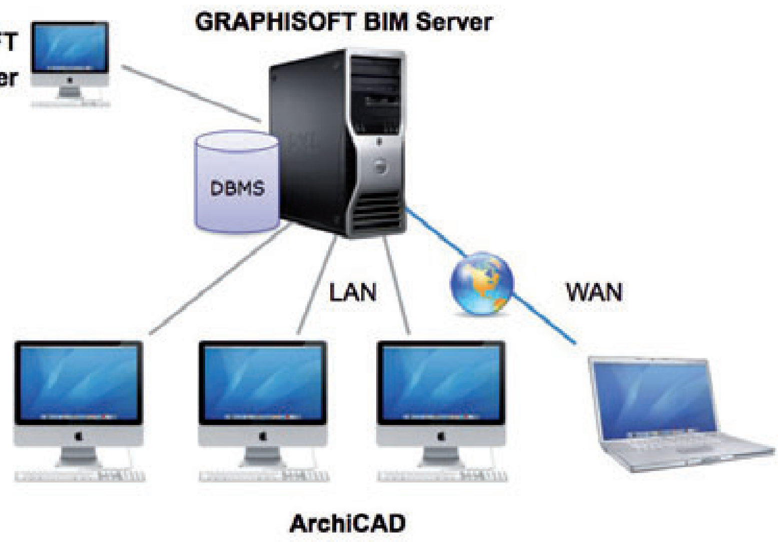
Teamwork is nothing without communication and



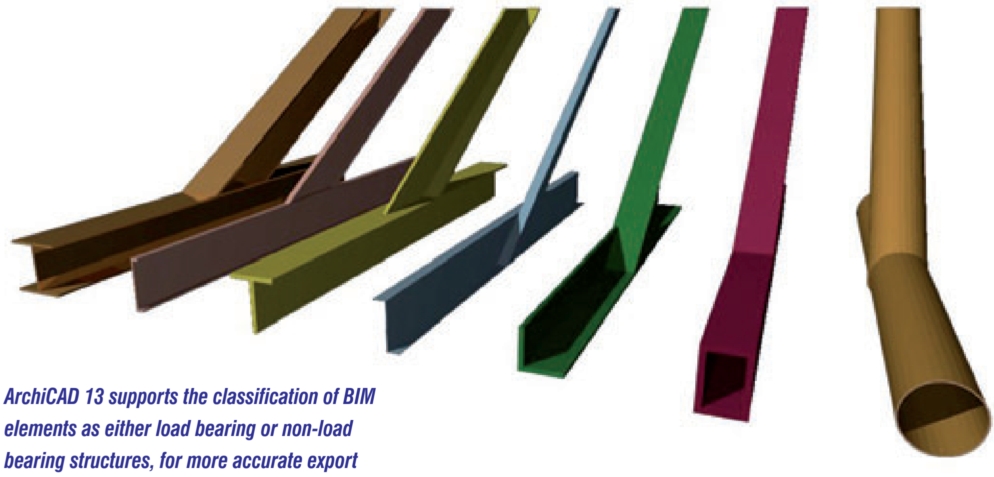
Every project member gets assigned a role, which can be remotely configured to allow varying degrees of access, view, creation and editing capabilities.

here there are some great features. Project members can request the granting of reserved elements from other designers. Teamwork also goes beyond the geometry, by enabling the allocation of reservations to views, publishing sets and element attributes. Graphisoft has developed a very clear method of finding out who has reserved what. The system even includes a built-in instant messaging system, which will help track those all-important design decisions and comments as the project develops.

Teamwork really is a game-changing implementation for workgroups BIM. Some may see it as a document management system but this really would be selling it very short indeed. With granular, real-time control of every aspect of the model and fully dynamic allocation of all elements, built-in messaging and incredible ease of use; I have to say that this is the transaction-based technology that all BIM solutions have been woefully missing all these years.



The infrastructure is a very traditional client server set-up. What makes this implementation remarkable is just how easy and fast it is to administer and use, wherever the project team members reside.



ArchiCAD 13 supports the classification of BIM elements as either load bearing or non-load bearing structures, for more accurate export to programs used by structural engineers.

Improved tools

ArchiCAD's standard feature set has also received some love and attention. The first thing to notice is that OpenGL has been improved to give a noticeably sharper and richer display.

Curtain walls can be quickly and freely edited without having to return to the curtain wall tool palette. Slab and roof edges can have a slant angle that can match and joint with other elements. 2D and 3D fills have also been improved to handle 'soft' insulation in composite structures better.

Graphisoft has always been excellent on data exchange and this release continues in that vein, uprating its compatibility with AutoCAD DWG, together with a classification for load and non-load bearing elements to enhance export to structural engineers — there are now thousands of steel profiles added into the product.

Other improvements have been made to view orientation, rulers, automatic dimensioning and object handling.

The other negative thing that BIM models are associated with is lack of performance. As models and information grows there is an impact on speed. In the previous release support for multi-core was added. In ArchiCAD 13, Graphisoft has ported the application to 64bit Windows, enabling access to Gigabytes of RAM, dramatically increasing potential project size and eliminating the need to cut models up into chunks. The 64bit Mac implementation should be available soon.

Conclusion

This is a big release for Graphisoft and its customers. Many of the longstanding fundamental issues that BIM-based architects have had to work around been addressed, from big issues like collaborative working and performance on large models to something as essential as improving soft insulation in composite structures or slant angles on slabs.

Teamwork's dynamic allocation of geometry and workspaces is incredibly powerful and simply done and sets the standard in the industry for how teams can simultaneously work on one BIM model.

While this is surely a brilliant release for existing customers, it will surely enhance Graphisoft's ability to compete against Revit at least within the architectural part of the construction industry.

Prices start at £2,400.

www.graphisoft.com



Informatix MicroGDS 11

MicroGDS is one of the AEC industry's long-standing CAD systems, and has a loyal customer base that benefits from its multi-user capabilities. Recently under new ownership, the developers are now looking to push the product forward into new areas, writes **Greg Corke.**

MicroGDS' roots stem back to the 1980s and over the years the CAD package has built a reputation for drafting efficiency, team collaboration and presentation graphics. Its user base comprises architects and multi disciplinary engineering firms and often-quoted customers include HLM, The Hillier Group and Scott Brownrigg.

While MicroGDS has both 2D and 3D capabilities, it is predominantly a 2D product and its approach to collaboration is simple, yet effective. It enables architects, electrical engineers, structural engineers and building services engineers to all work together on a project concurrently and it does this by splitting each MicroGDS project into many layers that are stored in a central project database.

While layers can be broken down by discipline, they can also be defined by other aspects of the design, such as a floor level, a specific part of a building, or even a single electrical circuit. At any one time, only one user is given 'write' access to an individual layer, but the others can still reference this layer and use it as the backdrop to their work. Any changes made to a layer will be automatically updated on other users' screens once the layer is refreshed.

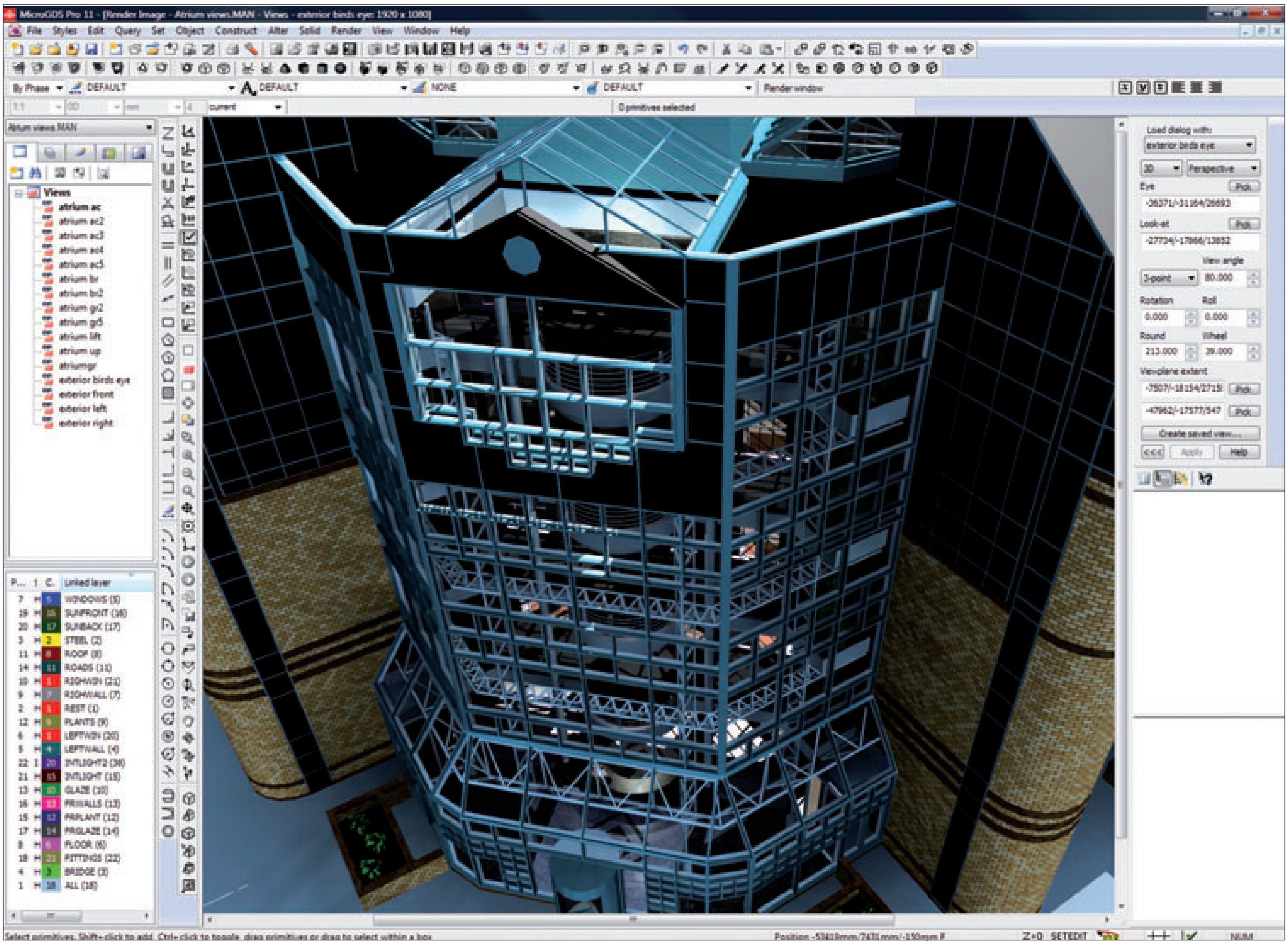
Working in this way, often with geographically dispersed design teams, communication is key. Here MicroGDS provides built-in 'chat' functionality so team members can keep up to date with who is working on what, and where they are in the process.

The new release

Version 10 of MicroGDS was released over two years ago and Version 11 is currently in the final stages of development, due to be released early 2010. As a result, it is important to note that this review is based on beta code, but Informatix expects that all of the functionality covered will be included in the final shipping version.

The major concentration for the new release is on providing productivity updates across the board, but the development team has also been looking to introduce a number of new technologies. This includes the ability to create intelligent parametric objects, and Informatix sees this as a first step to offering so-called Building Information Modelling (BIM) functionality inside the software.

However, the company has also introduced a new ADK (Application Development Kit) so MicroGDS can be exploited by third-party developers and used to build new CAD-focussed applications.



Final rendered image of an atrium exterior.

Productivity enhancements

A lot of the enhancements in this release are about increasing speed and efficiency in everyday tasks and we will deal with each of these in turn.

64-bit computing: MicroGDS has always had a relatively small footprint, particularly as users only load in the layers that they need to work with, as opposed to the whole project. However, with Version 10 some users that work with extremely large 3D models were running into memory limits, particularly when rendering. Now with 64-bit support, memory limits have been removed and MicroGDS 11 can address more than 4GB of memory, providing your workstation is fully equipped and running a 64-bit Operating System.

Customising the interface: MicroGDS preferences used to be stored in the registry, but this often caused headaches when deploying company or project standards, as everything had to be customised from scratch. Preferences are now stored in a hierarchy of XML files, which can be plugged into the system as and when required.

At the ground level, personal settings enable users to customise the user interface. These can be accessed from anywhere on a network so users can hot desk and are still be able to access their familiar working environment.

Moving up, preferences can also be controlled at a project level or domain level. Here the CAD manager can enforce drafting, naming or layer conventions and certain commands can be switched off and preferences locked down.

This ability to control standards and deploy them with ease will be of particular interest to those working on multi-site, multi-discipline projects.

Link resolution: MicroGDS can reference all manner of files inside each drawing, including line types, fonts, raster images, and instance files (similar to AutoCAD XREFs). Often, if drawing files are moved or if a server is not available, these links get broken and the user is warned of this when opening a drawing. In Version 10 the user would either have to fix any broken links there and then or cancel all the broken links and remember what was missing and fix them later. However, this would also involve going back into each individual command making the process inefficient.

In Version 11, missing links are gathered together and stored in a single dialog box. This can be accessed at any time by double clicking a little yellow triangle that resides at the bottom right corner of the screen with each missing link able to be fixed direct from the list. Working in this way, problems can be fixed at the pace of the user. It is a small enhancement, but one that will allow users to get on with the job at hand without getting bogged down in administration.

Axis control: Previously, MicroGDS had a single global axis system, but this made it difficult if users were flipping between views — interiors and site plans, for example — as the scale and axis origin had to be changed. In version 11 every window, or every view of data, has its own axis system, which reduces the possibility of errors creeping in by accidentally drawing at the wrong scale, or from the wrong origin or orientation.

Printing and export: MicroGDS layers are typically combined together to form a window definition — or a view of a drawing. Each layer can appear multiple times in a window and specific attributes or object names can be filtered out of each. This means window definitions can get quite complicated, especially if you have a large number of layers and want to combine them in different ways. Previously, when it got to the production drawings stage, in order to define plot styles, the actual window definition had to be changed or a new one created. Now the final output can be tweaked specifically for plotting purposes and the working window used for draughting can remain untouched.

Once the final production drawings have been created, the next stage is to print them out. Frequently, sets of drawings need to be produced and to deal with these more efficiently Informatix has introduced a series of batch commands. 'Batch Publish' takes what you see on screen and renders it to a file, while 'Batch Export' takes the underlying model and a window definition and puts that in another file. Output formats include a choice of PDF, DWG, DXF, DWF, 3DS, SVG and all the common raster formats.

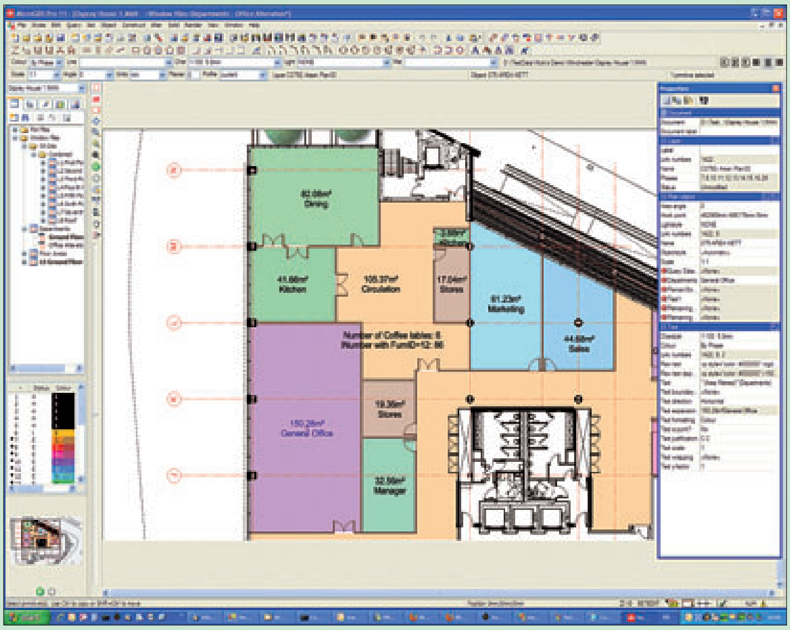
Individual export settings can also be saved in an XML file. For example, if a DWG file is being exported for a customer, users do not need to remember

Facilities Management

While Informatix encourages third-party developers to use MicroGDS as a platform for their own CAD-derivative applications, the company has also developed its own vertical application. Informatix Facilities Management (FM) provides a broad FM technology to cover anything from simple maintenance scheduling to enterprise-level asset management.

The software is an extension of MicroGDS Plus and stores graphics and numerical data in a central SQL database. It features asset management tools, scenario analysis, cost automation, asset capture through bar code technology and a wide range of reporting tools. It also includes the ability to view assets graphically and can integrate with a wide range of third party applications including other CAD programs, asset registry and enterprise software such as SAP and Oracle.

Users will also be able to add functionality to the FM solution through the Application Development Kit (ADK) in MicroGDS 11.



Informatix FM is a dedicated Facilities Management application built on top of MicroGDS.

The products

There are four levels of MicroGDS 11, each of which differ in terms of their multi user and 3D capabilities. At the entry level is MicroGDS Compact, which is for single users, is 2D only and costs £995

Moving up the scale and adding multi-user capabilities is MicroGDS Plus, which is available for £1,900. For single user 3D, MicroGDS Compact 3D costs £1,995, and for all-singing, all-dancing multi user 3D, MicroGDS Pro will set you back £2,995.

A promotion on the Pro version means that a copy of Piranesi, the artistic rendering tool, and a HP Z400 workstation ships with every license.

MicroGDS is available as a 30-day trial version and anyone who buys Version 10 will receive a free upgrade to Version 11 when it ships.


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whether or not to explode XREFs or include linestyles; but simply recall the XML file.

Rendering: The rendering engine inside MicroGDS 11 has been updated to LightWorks 8.1, a ray trace and radiosity renderer from LightWork Design. The two main additions are progressive rendering and ambient occlusion.

Progressive rendering starts off with a rough pass and refines the render over time. This enables users to get a good idea of how the final render will turn out without having to wait for it to be completed. Ambient occlusion is designed to better simulate the way light radiates in real life, especially off non-reflective surfaces.

When implementing LightWorks 8.1, Informatix also looked at making rendering more accessible to non-expert users. This was done by finding a balance between the level of control and the achievable quality of the final render. To do this, certain commands have been hidden or grouped into a single command, rather than giving users control over every single variable.

ADK — Application Development Kit: The ADK is a .NET library of functions that allow users to deal with MicroGDS data in different ways. The integrated ADK allows users to develop functions that sit within MicroGDS, while the standalone ADK,

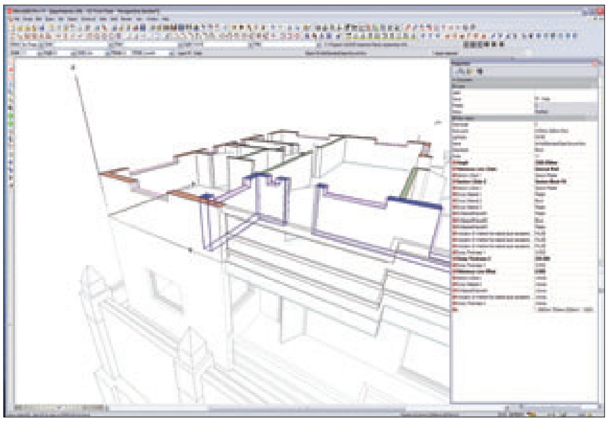
A lot of the enhancements in this release are about increasing speed and efficiency in everyday tasks.

which is a brand new addition for Version 11, enables customers to build an application that does not need MicroGDS, but can utilise its data.

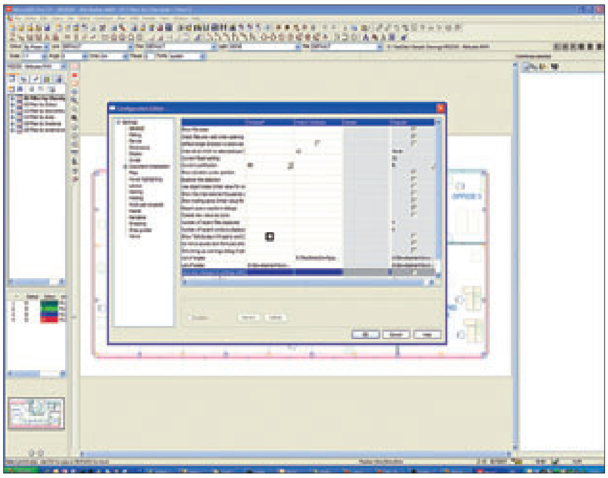
This means bespoke applications can be created with their own front end, for example, for building services, facilities management or more niche applications, such as redlining or surveying. In these instances, applications can also be designed specifically to run on low powered laptops as many of the more heavyweight functions such as 3D or rendering are not required. The integrated ADK development tool ships free with all versions of MicroGDS 11.

Intelligent objects: New for Version 11 is the ability to generate intelligent parametric objects that can automatically adapt to their environment. This forms the basis of a new collection of so-called BIM functionality inside MicroGDS 11 and is enabled by technology from the new integrated ADK.

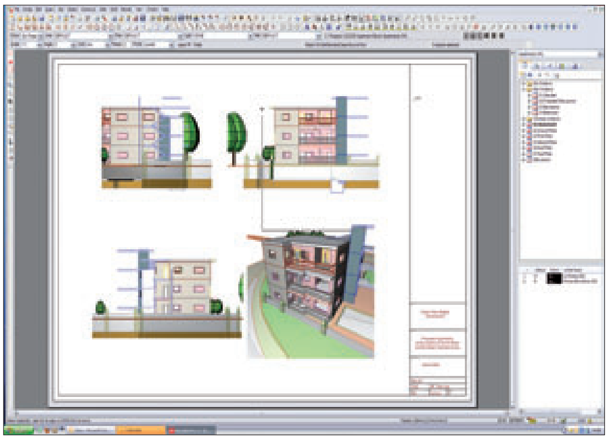
Informatix is building up a library of IFC (Industry Foundation Class) compliant objects. Each object is an independent ADK function and contains a number of attributes, some of which can be linked



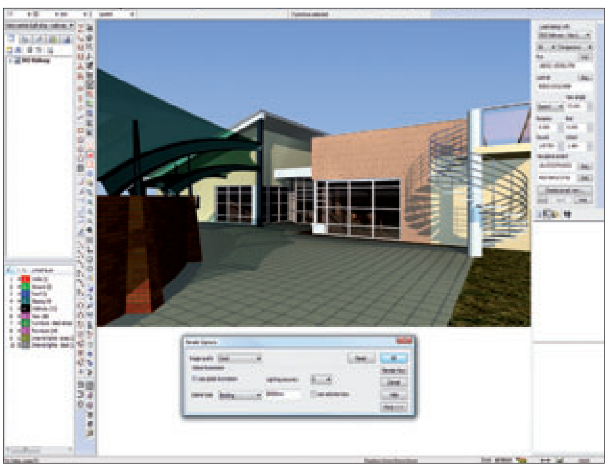
Above: ***MicroGDS has new intelligent objects, including walls, doors and windows, that adapt to their environment.***



Above: ***MicroGDS can be easily customised through the config manager.***



Above: ***Presentation graphics has always been a strong point of MicroGDS.***



The addition of LightWorks 8.1 brings progressive rendering to MicroGDS 11 so users can get a good idea of what a final render will look like before it is finished.

to each other parametrically. Each object also possesses a 'behaviour', so doors, for example, will automatically insert into walls and create openings. Then if the door is deleted or moved, the wall will automatically heal.

Each object features different representational graphics for each view, such as individual views for general arrangement, 3D, elevations, and sections. The representational graphics of objects can also be set to change according to scale.

The number of objects supported in MicroGDS is still relatively small and currently only includes walls, doors, windows, slabs and staircases. In addition, this content is not yet linked to specific manufacturers' products.

However, the generation of other objects, including curtain walls and roofs, are already underway and these will be rolled out in 2010. Informatix is also looking at ways to extract standard Revit objects using IFCs.

As each object is an independent ADK function, the user can simply plug them into MicroGDS as soon as they become available on the MicroGDS website. With the ADK it is also possible for users to create their own custom objects.

Conclusion

With new owners looking to push the product forward, MicroGDS is in a state of transition and there are three driving forces behind its development.

First, for existing users, there is a focus on making the system more efficient and its users more productive. This is being delivered through commands such as batch processing, axis control and preference management and while these are not headline grabbing enhancements they are sure to be embraced by the current user base.

Second, while the introduction of intelligent parametric objects will give Informatix the right to market MicroGDS as a so-called BIM solution, albeit one in its embryonic stages, the technology stripped back to basics is of more importance. For those that use MicroGDS as a production draughting system, the ability to model intelligent walls, doors, and windows will almost certainly increase draughting efficiency, and despite ticking all the right BIM marketing boxes, it should not cloud the true benefits of such a technology.

Third, the introduction of a standalone ADK means that third-party software developers can more easily develop their applications on top of MicroGDS or as a standalone application. From surveying and building services to structural engineering and FM, the scope is wide. With the new owners of Informatix open to negotiation on licensing costs, developers that may have been marginalised by Autodesk and Bentley in recent years, may now see MicroGDS as an attractive platform on which to develop more cost effective CAD-based solutions, either with standalone or multi-user capabilities.

www.microgds.com

Feeding the meter

In south west London the Traffic and Highways section of the London Borough of Merton is responsible for the design and implementation of traffic management schemes across 14.5 square miles of the capital. To do this it uses an application that combines the functionality of computer aided design (CAD) with the intelligence of OS MasterMap's location-based data.

Drivers may dislike yellow lines, speed humps and width restrictions but they all play a part in a safe and integrated transport network. At the London Borough of Merton CAD manager Bader Al-Sheibani uses computer-aided design (CAD) and OS MasterMap to ensure that traffic can flow safely and efficiently through the council's boundaries.

"Maps and AutoCAD are our spine and nerves: our way of understanding the borough and communicating with the outside world about such matters as road layout and controlled parking zones," Mr Al-Sheibani says.

For several years Mr Al-Sheibani's team of six was using Land-Line, which was supplied as DXF or NTF files, in a simple structure of points, lines and text. Data in this CAD-friendly format could be loaded quickly and easily into AutoCAD and viewed as tiles representing 500 square metres.

The section moved from Land-Line to OS MasterMap in 2007. OS MasterMap provides consistent and up-to-date information at address, street and building level in four data layers: Topography, Address, Imagery and Integrated Transport Network.

The team found the system easy to use. "MasterMap is fully themed and styled and great to use because it shows the details of a specific site in colour," says Mr Al-Sheibani.

Fact Box

Customer
London Borough of Merton

Challenge
Raise CAD data to GIS standards of intelligence without any loss of speed

Solution
Integrate OS MasterMap with AutoCAD

Benefits
- Maps are always accurate because regular updating is easy to manage
- Mail-merge files required for consultation process produced in one seventh of the time previously taken
- Mail-merge files contain business as well as residential addresses
- CAD archive files are always up to date
- Duplication and double entry eliminated

Return on investment
- Departmental cost-efficiency has increased
- Printing costs minimised because consultation documents are always correct

However, OS MasterMap is delivered in GML [Geography Mark-up Language] files, which are much larger than their Land-Line equivalent and cover an area of 2,000 square metres. This increased level of detail was found to slow users down when working with CAD, making it harder to zoom and pan.



Traffic calming speed bumps in the London Borough of Merton.

The solution

Mr Al-Sheibani decided to recreate the look, the feel and the lightness of Land-Line without losing access to any of the depth of intelligence that OS MasterMap provides.

Working in AutoCAD Map 3D, he took the GML file for each 2,000 square metre tile and divided it into four tiles of 500 square metres. The original file name was given to the bottom-left tile in each set of four, this name being taken from a point on the National Grid. Their geographic co-ordinates in relation to this point identified the new tiles.

"Because there is so much detail in the polygon geometry of the OS MasterMap GML files, there are lots of lines. As lines such as road markings are particularly significant in traffic management, we needed to clean them up a little," he explains.

To go through this deletion process for about 170 files would have been very time consuming. Mr Al-Sheibani therefore developed a special application to process raw OS MasterMap data and run a program to clean it.

"I gradually did all the tiles, cleaning and saving each one." He then created an application within AutoCAD that allows users to quickly insert the Ordnance Survey tiles. "The CAD user can insert the tile either by typing the street name or by clicking an area on the screen."

Because the underlying data is from OS MasterMap, Crown copyright acknowledgment is required for all drawings. To ensure compliance, Mr Al-Sheibani wrote another program, so that if a user decides to plot without having included copyright details, a prompt appears reminding the user to insert the Crown copyright text.

Benefits

The Council receives OS MasterMap updates every three months. Mr Al-Sheibani looks to see where the changes are in the new GML files: then he only has to update the relevant tiles. While he spent one month on the painstaking process of creating individual tiles, it now only takes him three hours to manage each update tile by tile.

"The ability to update easily is a significant benefit. Local government departments that opt for updates once a year can be up to 12 months behind and they have to do a massive update, discarding all their information and starting afresh.

"It was a huge undertaking for us when we moved



A cycle route through one of the busier parts of Merton.

from OS Land-Line to OS MasterMap, so I know that an update of that magnitude would typically take one month."

In contrast, four days per year is spent on updating and the Borough is only ever a maximum of six weeks out of date.

Public consultations form part of the implementation of traffic management schemes. To obtain the address points, Mr Al-Sheibani first specifies the area affected. Then, using AutoCAD Map 3D, he imports the MapInfo TAB file that is created and maintained by the Council's GIS team.

Once in AutoCAD Map 3D, the addresses can then be exported to an Excel spreadsheet to be filtered and formatted, and then used to generate the mail merge.

The process of obtaining address points is now very speedy — one seventh of what it was. "It takes five minutes to filter, clean and export an address file. A complete mail-merge file, on average containing 500 addresses, is ready within an hour.

"It used to take one person a whole day to access various databases, export packets of information separately and create a different mail-merge file for each packet. Having done all that, the final result was not comprehensive because all the data was based on the electoral roll and excluded business addresses." The section works on about 20 schemes each year, so this represents a significant efficiency improvement.

According to Mr Al-Sheibani, the combination of OS MasterMap and AutoCAD Map 3D has opened up a fruitful collaboration between the Borough's specialists in Highways and Traffic and those in GIS. "The two departments have been quite separate. Because we deal with road markings and signage, we have always been CAD oriented while GIS dealt with addresses, trees, street furniture and drains."

When the Highways and Traffic team previously created a CAD file for road markings in one area, the file would be archived after the scheme was implemented. With schemes continually being revised, it was possible that two or three years after the original implementation there might be three copies in the archive, two being out of date.

This required huge amounts of storage and created the potential for error.

"Now OS MasterMap acts as one single source for reliable geographical data; when the source is amended the CAD file is automatically revised. We always have an updated record of existing marks such as yellow lines, whereas before we often had to go out as a team to take photographs and measurements. This means that we can start new schemes much faster," says Mr Al-Sheibani.

"The ability to update easily is a significant benefit. Local government departments that opt for updates once a year can be up to 12 months behind and they have to do a massive update, discarding all their information and starting afresh."

London Borough of Merton CAD manager Bader Al-Sheibani

Return on investment

"The combination of CAD and GIS gives us accurate plans and eliminates duplication, double entry and lengthy processes," says Mr Al-Sheibani. "This has a clear impact on efficiency, performance and the integrity of consultations.

"Obviously, it has an effect on cost. We avoid the risk of drawing schemes on old maps and printing consultation documents that are out of date, a potential problem for many councils. We regularly save time on preparing address files; and updating our master data is simple."

www.ordnancesurvey.co.uk/oswebsite/products/osmastermap/


NORTON
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Paying by Czech







The global recession is doing little to slow public appetite for high street shopping and new shopping centres continue to sprout up, such as the Žižkov complex in Prague, Czech Republic.

These highly detailed visualisations from Bristol-based firm Architecture in Motion were designed to display the proposed build at its busiest, with bustling public areas.

The team were required to model the entire interior of the project, across three levels, so it could be viewed from any angle.

Working on the project over the space of one month the final designs were completed with a good relationship with the architects and trips to nearby shopping malls.

"A technique we developed for the images was to visit a local new shopping complex to gather photos of people from the correct heights and brightness to eliminate the usual perspective problems associated with using cut out people," explains Architecture in Motion director Christian Jackson.

He added that for this first interior project the scale and complexity was different to the firm's usual exterior visualisations.

The team set out to achieve a realistic shopping environment and lighting, and to avoid repetition of shops throughout the entire three floors. Balancing light levels were the biggest issue they had to overcome.

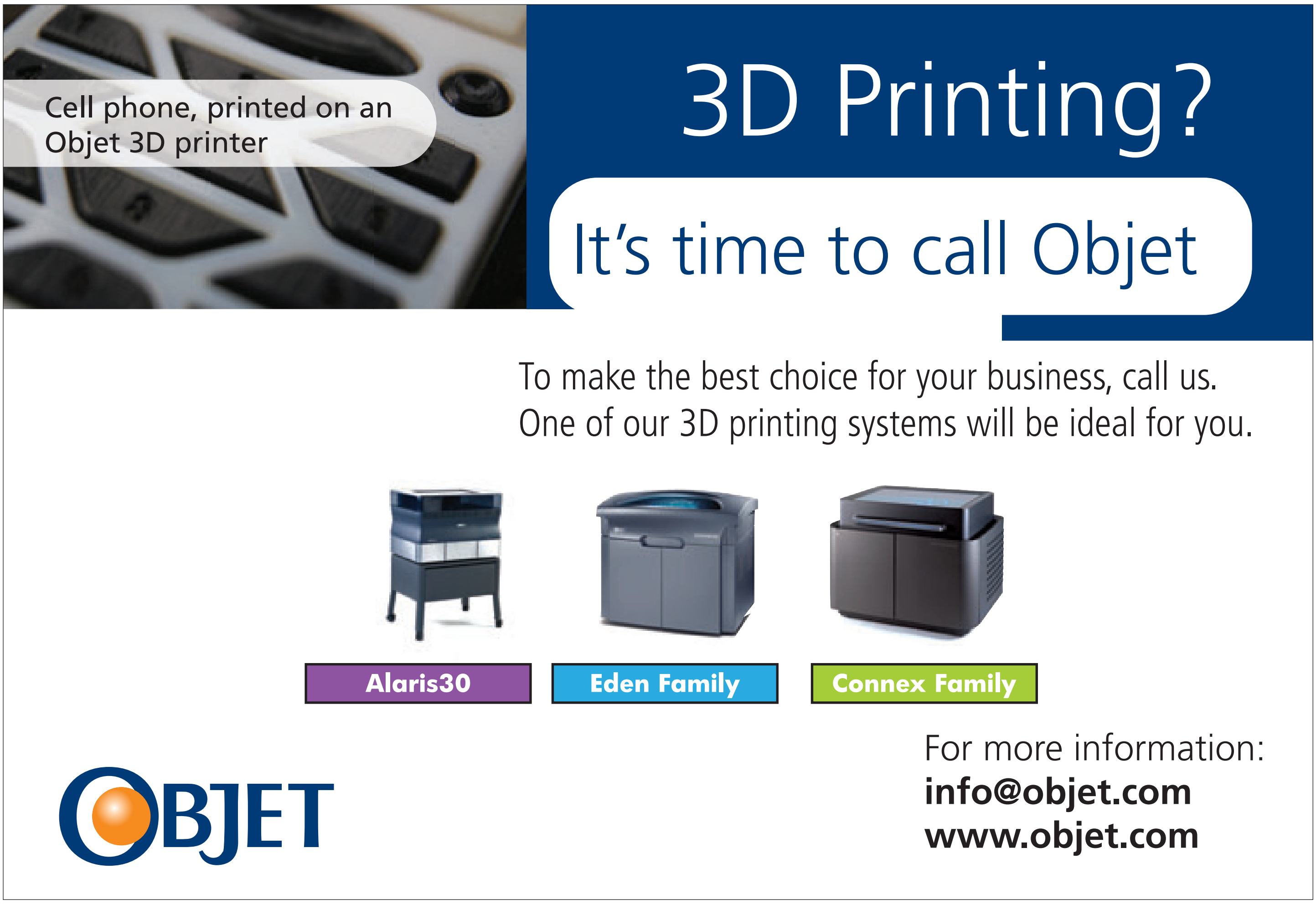
Balancing the sunlight of the copious natural lighting against bright shop interiors proved to be a tricky task to get right.

"Liaising with the architects we would take basic plans and sketches then create complex and varied 3D elements such as shop interiors, escalators and canopy structure using a mixture of reference material from photos to basic sketches and 3D elements created by the architects in Sketch up," says Mr Jackson.

The final renders were created using 3ds Max, and utilising the V-Ray rendering engine as well as its proxy elements.

Now all the final building needs is to be as busy as these lively scenes of shoppers with bags brimming with new purchases.

www.architectureinmotion.com


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HP SkyRoom 1.0

Video conferencing and real-time collaboration for 3D CAD is the name of the game with HP's long awaited SkyRoom technology. It is certainly an exciting debut, but **Greg Corke** is already calling out for Version 2.0.

A few years back 'collaboration' was THE marketing buzzword. Joe collaborated with Jane and Jane collaborated with Jack — all using the latest collaborative design software. Today, while the hype has settled down and CAD software companies have new marketing check boxes to tick, one may argue that the 'c' word has never been more relevant.

Restrictions on business travel — for economic or environmental reasons — mean that the ability to collaborate effectively with geographically dispersed colleagues is becoming increasingly important. While video conferencing and online collaboration tools have been around for over a decade, with its new SkyRoom technology HP thinks it has something special on its hands.

SkyRoom provides a collaborative design environment where users can share desktops and talk face to face with extended design teams using standard PC webcams and microphones. While mainstream tools like Microsoft Meeting and GoToMeeting already offer this type of functionality, HP believes it has the edge when it comes to working with interactive 3D datasets. In order to maintain the smooth appearance of 3D models when they are manipulated on screen, a huge amount of data needs to be sent and it needs to be sent quickly and processed efficiently.

Remote Graphics software

Sending vast amounts of information through the ether to different locations is no trivial task and this is where HP's Remote Graphics Software (RGS) comes into play. Originally designed to send data back from Mars, the technology uses highly efficient compression algorithms to stream pixel data.

Starting off on the presenter's machine SkyRoom works by monitoring and updating only changes in screen appearance — not the entire display — then compresses the information before sending it to the participants, where it is decompressed and updated. In this way network traffic is said to be greatly reduced.

HP is focusing the technology on local networks but the reach of SkyRoom can also be extended beyond the firewall using Virtual Private Networks (VPNs) and work on expanding this to any TCP/IP connection is already under way.

Obviously bandwidth is an issue and at 300-400k/sec (up and down), the minimum requirements for SkyRoom are not trivial. As the compression algorithm is multi-threaded, multi core PCs are also required. However, powerful 3D graphics cards are not mandatory in every machine. As SkyRoom only streams 2D pixel data and not 3D vector data, it is only the host workstation that needs a 3D CAD-capable graphics card. The participant's machines just need a 2D graphics card capable of playing HD video.



SkyRoom comes free with every new HP Z Series workstation. All that is required is a webcam, microphone and speakers.

SkyRoom's use of 2D pixel data also has added security benefits. Because intelligent vector-based CAD geometry is never shared, confidential data will not 'accidentally' fall into the wrong hands.

Setting up a collaborative session is incredibly easy to do. The presenter can invite up to three team members from a 'buddy' list and once they accept and face-to-face contact has been established the host 'ring fences' an area on his or her desktop to share. This could be a simple document or the modelling window in a 3D application. The view inside this 'bounding box' is then displayed on each participant's screen and constantly updated in real time. In demonstrations we have seen over local networks there is no discernible lag and both the 3D model and streamed video are incredibly smooth. However, these were canned demos and we have yet to see this technology in action over VPN.

One of the most attractive things about SkyRoom is that it comes free with every new HP workstation. However, SkyRoom is not limited to HP hardware and is compatible with most dual core Windows machines regardless of brand. In this case it is available for purchase for £100 per seat.

Limitations

While SkyRoom's beauty is certainly in its simplicity, there are some significant limitations when it comes to collaborating effectively. Participants can not take control of the host's keyboard and mouse, and there are no markup tools available. These omissions are certain to make it hard for participants to discuss specific parts or design elements, and feedback is limited to verbal instructions. In addition, as the software can only be used externally using VPN, careful planning will be required to make sure all design, engineering and supply chain participants can be hooked up to the system.

Conclusion

Ever since HP launched its Remote Graphics Software (RGS) it has been crying out for someone to get their claws into it and turn it into a marketable tool for collaborative design. This has now happened with HP SkyRoom, where up to four participants can collaborate on a design and experience the benefits of a face-to-face meeting, albeit a virtual face-to-face meeting.

While this initial release shows much promise it is still a way off from being the finished product. Face-to-face discussions are certainly an important element of collaboration, but SkyRoom lacks those all-important tools required to get every participant directly involved with the 3D geometry, though we are told this will be addressed in future releases.

Despite its limitations, SkyRoom is still an interesting technology — and becomes even more so when you consider it comes free with every new HP workstation.

At a time where users are looking to get more out of their technology, this is a certainly a major value add for HP in the increasingly competitive workstation sector.

Information

Product: SkyRoom
Supplier: HP
Price free with any HP workstation.
£100 for standalone license
hp.com/go/hpskyroom

HP DesignJet T1200 printer

HP's new whisper-quiet DesignJet T1200 offers production-level features in a workgroup printer. With two rolls it can deliver linework drawings and photorealistic renderings without having to swap over media, writes **Greg Corke.**



Despite the move to digital workflows the A0 printed drawing still has an important role to play in design and engineering. It allows project participants to see both the big picture and details at the same time helping highlight nuances of a design that simply would not have been seen before.

Of course, the maturation of 3D CAD and all the stunning design visualisations that are born out of it has had a major impact on what we print. In architecture, for example, line drawings, complex 3D renderings and fine text all sit together on the same sheet to help sell concepts and win projects. Rendered details are also more appealing and help the non-expert understand the project. This is true for all areas of design.

With the exception of Océ's ColorWave technology, in order to mix all of these graphic elements on a single printed sheet, inkjet continues to be the technology of choice.

HP has dominated the wide format inkjet market for many years and its DesignJet brand has stood firm for over 20 years. The key to its success has been consistent innovation, not only in relation to print speed and quality, but also in terms of ease of use and overall productivity.

With a view to taking small to medium workgroup printing to the next level HP has just announced a complete overhaul of its technical range of DesignJets.

Heading up the new range is the two roll DesignJet T1200, a 44-inch (A0+) printer designed for workgroups of 10 or more users.

Designed as a direct replacement to the DesignJet T1120, there are many welcome enhancements, primarily to enable longer unattended printing, but also to enhance productivity in a networked environment, so let us look at each of these in turn.

Two roll printing

In a workgroup environment, managing the output of linework and photo quality prints is not easy. For high-quality photorealistic renderings, special photo paper is required, but this is too expensive to use all day long if a big proportion of your output is plans and elevations.

As workgroup printers traditionally only have one roll, to use a single machine for this dual purpose requires careful monitoring to ensure people do not send linework print jobs when photo paper is loaded. It also means downtime when rolls have to be changed. The T1200 overcomes this by supporting two rolls, a first for HP in its workgroup product range. Users can submit both types of jobs and the system will automatically swap between rolls, all in a matter of seconds. As with all printers, this process can occasionally fail, but HP boasts a 99.97% reliability rate for its DesignJet T1200.

In addition to offering two roll printing as standard, the DesignJet T1200 can also accept single sheets, which increases the flexibility yet further. For example, workgroups could install an A1 and A0 roll of standard coated paper, with one off photo quality prints loaded in sheets.

Product Information

Product: DesignJet T1200
Supplier: HP
Price from **£4,635**
www.hp.com/designjet

Memory

Featuring 32GB of dedicated file processing memory, this is a huge step up for HP's medium workgroup printer. It means that when data is output directly from a CAD system in HPGL/2 or a vector-based PDF file is sent, all of the raster processing is done on the printer and not on the workstation that submits the job.

As vector data is much smaller than raster data, this can significantly reduce network traffic, up to 50 times in some cases, says HP. This is significant, even on Gigabit Ethernet, which comes standard on the T1200.

In-printer processing also decreases the load on the CAD workstation, both in terms of CPU and memory. During development HP threw a combination of complex linework, text, renderings and photos at the printer, but says it has yet to find a file it could not handle.

Of course, as the DesignJet T1200 is a network

printer, multiple print jobs can be queued up and stored on the in-built 160Gb hard drive. And for those worried about data security a removable hard drive, that can be locked in a safe overnight, is available as an option.

Noise

While this is something most users take for granted when using a large format machine, print noise can be very distracting in a workgroup environment. During the development of the new DesignJets, HP undertook an extensive research project to find the exact source of the noise. Then, by refining various components and the use of new materials, managed to reduce the operation noise by four times (or 11 decibels) when compared to its previous model. According to HP, this is the equivalent of the sound of a TV compared to a modern fridge on standby. Analogies aside, we found the printer to be incredibly quiet in use — maybe even too quiet for those that like a bit a background noise in their office environment!

Ink

As with the previous generation DesignJet T Series printers, the T1200 features three blacks. This means traditional matt black for line drawings, photo black for true black on glossy paper and a separate grey to help achieve better grey tones. With one eye on creating a workhorse linework printer, the ink capacity of the matt black cartridge has been increased to 300ml. The other blacks and Cyan, Majenta, and Yellow remain in cartridges of 130ml or 69ml.

Quality and speed

In relation to its predecessor, the T1120, the DesignJet T1200 boasts a slight increase in print speed printing an A1 line drawing in Economode (draft) in 28 seconds. This is compared to the 35 seconds it takes on the T1120. The quality of Economode is quite impressive for a draft mode and perfectly acceptable for design/review.

Naturally, print quality varies greatly according to the media used. Line drawings appear crisp, but not supersharp, on HP's Universal bond paper (80g/m2). For a combination of incredibly sharp lines and rendered details HP's new cockle-free coated paper (100g/m2) delivers excellent results, but for photo quality renderings its universal high-gloss photo paper (190g/m2) delivers truly stunning results. Prices start at £11, £26 and £60 respectively. Of course, with its two rolls and sheet feed on the DesignJet T1200 it is incredibly easy to mix these media types.



HP's InstantPrint 3.0 enables non-technical users to print a wide range of files including PDF and DWF, without having to open the authoring application, even from directly within Outlook.

Instant Print 3.0

HP's InstantPrint utility provides non-technical users with a simple utility for printing large format without having to open the file.

The software supports a number of file formats, including PDF, PowerPoint, and HPGL/2, but for version 3.0 this has now been extended to Word, Excel, TIF, JPG and most interestingly for Autodesk users, DWF, which is supported in all Autodesk applications. The new version also allows users to print straight from attachments in Outlook, so there is no need to save to the desktop first.

Printing from HP's Instant Print Utility is as simple as right clicking on one or more files, choosing an installed printer and selecting print. The system can auto-scale, auto-rotate, and offers real-time print preview so you can see exactly how it will fit on the sheet — or not as the case may be.

For files that are scaled, a watermark can be automatically added to warn users not to take direct measurements off the drawing. The system can also be configured so prints are never scaled and will warn users if they will not fit on the paper loaded into a machine. When printing multiple copies of multiple drawings the software can auto collate so you do not have to sort out into groups. Finally, a job accounting ID can be included for project or customer cross charging.

Version 3.0 has just been released and the good news is it works with virtually all DesignJet printers, old and new. It is a free download from HP's website.

Conclusion

Despite being classified as a workgroup printer, HP's DesignJet T1200 is starting to take on many of the characteristics of a production level machine and when it comes to its substantial 32Gb of memory surpasses them.

The most significant development is the provision of two rolls. Historically, many firms have needed two printers — one for high throughput line drawings and the other for occasional premium quality photo output. While most modern inkjets can support both types, swapping rolls and making sure submitted jobs get printed on the right media is often hard to juggle.

The DesignJet T1200 solves this problem and this, along with its ability to process large files efficiently and print quietly, is an exciting new development in wide format workgroup printing.

The T1200's younger siblings



In addition to the DesignJet T1200, HP has also launched the A0+ DesignJet 770 and the A1+ DesignJet T620, both targeted at smaller workgroups.

Featuring the same print speed as the DesignJet T1200, the DesignJet T770 is similar in many ways. The main differences are it only has a single roll and features 8GB memory instead of 32GB. While this is still plenty of memory for most print jobs, those printing high-res photo images may find the processing is pushed back to the workstation during peak loads. Other differences include 100Mb Ethernet instead of Gigabit and all of its cartridges are 130ml or 69ml. The DesignJet T770 starts at **£2,852** (£3,610 with a hard drive), compared to the DesignJet T1200, which starts at **£4,635.**

The smallest addition to the new DesignJets is the A1-sized T620. This is virtually identical to the T770, but has a slightly slower print speed of 35secs per A1 and is not as quiet — 57db compared to 46db. Or to borrow HP's analogy, a TV compared to a fridge. The DesignJet T620 costs **£1,837.**

Z Corporation ZPrinter 350

While Z Corporation made its name with full colour 3D printers, it has recently released a lower-cost monochrome machine. **Al Dean** explores what the ZPrinter 350 brings to the entry-level of this increasingly competitive market.

Over the past year Z Corporation has been revamping and reconfiguring all of its 3D printers.

In the high-end, colour ZPrinter 450 and 650 spectrum machines features such as automated powder loading, integrated breakout and post processing stations and powder recycling have been introduced, but now these features are trickling down the product range.

The latest machine to get this treatment is the ZPrinter 350, a brand new low-cost product that caters to the entry-level market and reduces cost by only printing in monochrome.

Like the colour ZPrinter 450, the ZPrinter 350 features a good-sized build chamber of volume of 203 x 254 x 203mm. The production process is the same as with the other Z Corp machines, but the initial part set up in Z Corp's Z Print is slightly easier because it does not require the user to assign colour. Multiple models can be built at the same time and as the machine is powder based these can even be placed on multiple levels.

Once the model set up is complete the data is transmitted to the machine over the network. The build begins by first heating the build chamber and then the model is built up layer by layer on the platform. Power is fed in automatically and a complete layer (between 0.089 and 0.102 mm thick) is first spread on to the platform.

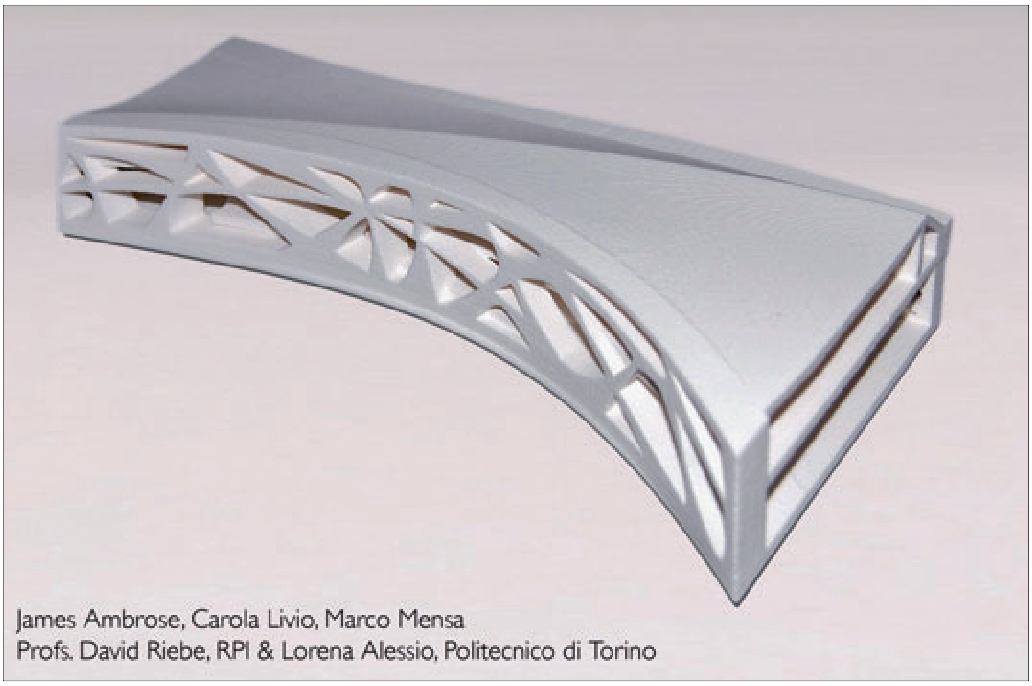
Next up the areas required for the part are printed with the cartridge fed binding agent which solidifies each layer.

Each subsequent layer is then printed on top of the other until the form of the build is complete. At this stage the automatic powder recycling kicks into action, removing the excess unused powder for reuse later, leaving the completed part/parts.

The next stage is to move the parts over to the post-processing chamber, which sits to the right of the build chamber. Here, an air hose can be used to remove the rest of the powder and the part can be strengthened.

Depending on their geometry, when models first come out of the build they can be quite fragile. While the new ZP150 composite powder means that they are less fragile than before, it is still advisable to toughen them up to withstand the rigours of inspection and design review.

To do this the models can be infiltrated with cyanoacrylate, and while this may sound rather complex, it pretty much involves brushing them over with superglue.



Models made in Z Corp's new ZP150 composite material are less fragile and whiter than previous materials.



The new ZPrinter 350 features automatic powder recycling, break-out and post processing previously found in the higher-end models.



The machine dial gives more control over how the printer operates.

Conclusion

With Z Corp having made a name for itself in colour 3D printing, the question is why go monochrome? The first reason is to save money. This ZPrinter 350 is not only cheaper than the colour models but has a marginally lower running cost due to the use of a single binder, rather than separate colour ones. But then some users simply prefer plain, white models.

The $20,500 price tag is not the cheapest on the market. There are lower cost commercial machines including the Solido and Dimensions' uPrint, but where the ZPrinter 350 stands out is in its lower cost consumables, impressive throughput and greater build volume. This coupled with the new high-end features such as powder recycling and integrated post processing makes it an interesting addition to the low-cost 3D printing market.

Product

ZPrinter 350
Supplier:
Z Corporation
Price $20,500
www.zcorp.com

Specifications

Build envelope	203 x 254 x 203mm
Build speed	20mm per hour
Stackable build chamber	Yes
Layer resolution	300 x 450 dpi resolution
Layer thickness	0.089 - 0.102mm
Material type	ZP150 composite powder
Material loading	Automatic
Reusable material	Yes (automated)
Post processing requirements	Cyanoacrylate infiltration (standard)
Machine size	1,220 x 790 x 1,400mm

Workstation Specialists WS1400

An impressive, near silent entry-level CAD workstation which benefits from the enhanced TurboBoost feature in Intel's new Core i5 processor. By **Greg Corke**

With the levels of performance offered by today's multi-core chips, the term 'entry-level workstation' is often a bit of a misnomer. For CAD, virtually all modern workstations are powerful enough for standard modelling tasks and it is only when you start upping the ante with huge models, rendering, or analysis that specs need to be stepped up a notch. As tech progresses, yesterday's 'mid-range' soon becomes today's 'entry-level' and by embracing Intel's new Core i5 processor at the heart of its new WS1400 workstation, this is effectively what Derby-based Workstation Specialists (WS) has done.

Until recently Workstation Specialists used Intel's Core 2 Duo as its entry-level workstation processor, reserving the Core i7 for its mid-range machines. However, with the introduction of the Core i5 and new generation Core i7 processors, this has changed and WS is now able to boost the performance of its entry-level workstation range, without significantly increasing the price point.

The WS1400 is available with three processor options — the Core i5 750 (2.66GHz), Core i7 860 (2.80GHz) and Core i7 870 (2.93GHz). While the Core i5 750 inside our test machine enables WS to bring the price in just under the £1,000 mark, those that use rendering alongside their everyday CAD work would probably consider an £85 upgrade to a Core i7 860 money well spent. This not only boosts clock speed, but adds support for HyperThreading, which increases performance in virtually all rendering applications. For example, we would expect around a 15%-20% reduction in rendering times in 3ds Max when moving from the Core i5 750 to the Core i7 860.

WS recently standardised on a single chassis for all of its workstations, from the entry-level to the high-end, and its machines now have a distinctive look. A front panel hides the DVD tray, but the USB and Firewire ports and headphone and microphone jacks can still be accessed when the door is shut.



The Core i5 is incredibly power efficient and this equates to significantly lower running costs, particularly when compared to the Pentium 4.

The downside of using the same chassis across its entire range is that the W1400 is fairly large for a workstation of its standing, particularly when compared to entry-level machines from the likes of Dell, HP and Lenovo.

Compact, not exactly, but quiet yes. As is typical for most WS machines, the WS1400 is virtually silent in operation, even at full load. From our past experiences, it is obvious that the tech guys at WS have a good handle on how to efficiently cool a workstation, but some of this has to be down to the incredible thermal efficiency of the new Intel chip. Intel quotes a maximum Thermal Design Power (TDP) of 85W for the 2.66GHz Core i5 750 (compared to 130W for the previous generation 2.66GHz Core i7 920) and in short less heat means less to cool.

The reduced power requirements also equate to lower running costs. In terms of the overall power consumption of the WS1400, WS quotes 0.9W on standby, 42W on idle, 73W on full load single CPU core and 120W on full load all CPU cores. For those considering an upgrade from a Pentium 4-based workstation, one of Intel's most inefficient CPUs in recent years, the WS1400 is claimed to use up to three times less power, which over the course of a year equates to a significant amount of cash saved. Get out your kWh calculator to find out exactly how much.

In submitting this machine for review as an entry-level workstation, one of the key aims was to keep the price under £1,000. A careful choice of graphics card is a major contributing factor to this, and AMD's FirePro V5700 represents excellent value for money, even though it is positioned as a mid-range card. It also put in a strong performance in all of our 3D benchmarks.

In terms of memory the WS1400 supports dual channel instead of triple channel, which is standard in all Core i7 900 series-based workstations. While this means reduced memory bandwidth, most CAD users should experience little difference. However, it may cause a slow down in memory intensive rendering or simulation applications.

The upside of dual channel memory is increased flexibility. Because memory is deployed in pairs rather than in multiples of three, WS can offer 4GB (2 x 2GB) as its standard entry-level solution, instead of 6GB (3 x 2GB). This is because it considers 3GB (3 x 1GB) to be too little for most 3D CAD users.

Overall, the WS1400 is a highly capable entry-level workstation and the increased TurboBoost in the Core i5 makes it an excellent choice for users of single threaded CAD applications. For anyone using rendering software, a £85 upgrade to the Core i7 860 is a worthwhile investment, simply to get access to HyperThreading's virtual cores, but the £300 upgrade to a Core i7 870 would be harder to justify.

For those on an even tighter budget a downgrade to a FirePro V3750 would still make it a great entry-level machine for 3D CAD and bring the overall system price to just over £800.

The lowdown on Intel's Core 15

Intel announced the Core i7 at the tail end of 2008 and this brought Quad Core processors to the mainstream. Now it has launched the Core i5 processor, which is designed specifically for price/performance. Alongside this it has also introduced two new mid-range Core i7 processors.

The Core i5 750 (2.66GHz), Core i7 860 (2,8GHz) and Core i7 870 (2.93GHz) are all based on a new technology from Intel called Lynnfield. This is an evolution of the original Core i7 architecture and will co-exist with the current Core i7 900 series, which at time of print was available in clock speeds of up to 3.20GHz.

The Core i5 and all the new Core i7 chips are quad core, and while there are many similarities with the original Core i7 900 series CPUs, they are based on the new smaller LGA 1156 socket. This means they are not compatible with previous generation motherboards. They are also more energy efficient. Elsewhere, dual channel memory is used instead of triple channel memory, and turbo mode, which dynamically overclocks a single CPU core when others are idle, has been boosted from 266MHz to 667MHz. This should be of great benefit for users single threaded CAD applications.

So what is the difference between the Core i5 and the new Core i7 processors? Apart from the clock speed, it all comes down to HyperThreading (HT), Intel's virtual core technology. The Core i7 supports HT and as a result can feature eight virtual CPU cores, whereas the Core i5 is a standard quad core processor. However, HT only really makes a difference under rendering applications.



www.intel.com

Specifications

- Intel Core i5 750 (2.66GHz) processor
- 4GB (2 x 2GB)
- DDR3 (1,333MHz) memory
- WSX motherboard (Intel P55 Chipset)
- 160GB Seagate Barracuda hard drive (7,200RPM)
- AMD ATI FirePro V5700 graphics card (512MB)
- Windows XP x64 (with free Windows 7 Upgrade)
- 36 months full parts and labour warranty

Price: £999
www.workstationspecialists.com

Benchmarks
Graphics (frames per second - bigger is better)
3ds Max Design 2010 — 4.4
CPU (secs — smaller is better)
3ds Max Design 2010 — 496

